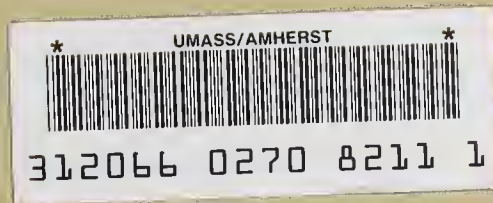


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Guidelines for Operations And Land Stewardship



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J. Harry Rich State Forest



Massachusetts Department of Environmental Management

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**Guidelines for
Operations
And
Land
Stewardship**



J. Harry Rich State Forest


**Division of Forests and Parks
Division of Planning and Development**

March 1988

**Commonwealth of Massachusetts
Michael S. Dukakis, Governor**

**Executive Office of Environmental Affairs
James S. Hoyte, Secretary**

**Department of Environmental Management
James Gutensohn, Commissioner**



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Chapter One

Introduction

DESCRIPTION AND PURPOSE OF THE GOALS PLAN

The Department of Environmental Management (DEM) is charged with the management and development of the Massachusetts state forest and park system. It is a system of more than a quarter of a million acres from the Boston Harbor Islands to the peak of Mount Greylock in the Berkshires. To ensure that these properties will provide the best open space, natural resource conservation, and recreational opportunities for Bay State residents and visitors, the Department has launched a program known as GOALS (Guidelines for Operations and Land Stewardship). GOALS is a systematic planning process through which plans are prepared for forest and park lands which spell out the area's management needs and constraints. This management plan, tailored to J. Harry Rich State Forest, serves as a guide for the sensitive operation and management of the Forest's renewable as well as the irreplaceable resources in DEM's trust.

The planning process for J. Harry Rich State Forest involves six major components:

Define the Area: the natural and man-made features of the Forest are inventoried as are ecological relationships, public uses, and relationships with nearby communities. This provides baseline data and information upon which planning can be carried out.

Identify Issues and Opportunities: early in the planning process, the resource and public use issues and opportunities are identified so they can be adequately researched and addressed in the plan. Some of the key issues and opportunities that are of concern at J. Harry Rich are trail use, forest management, river related recreation, interpretation and limited development for recreation.

Action Recommendations: based on an analysis of the inventoried resources and issues and opportunities, specific action recommendations are developed to guide the long-range management of the Forest. Specifically, these recommendations will be reflected in the annual work plan and operational and capital budget requests for the Forest.

Land Stewardship Zoning: using a resource management zoning classification, J. Harry Rich State Forest is divided into separate zones based on natural factors to ensure that resource values are protected from incompatible uses. This zoning system is the cornerstone of GOALS and will be discussed in further detail in the Analysis chapter.

Public Participation: to facilitate public participation in the management of the Forest, the J. Harry Rich State Forest Advisory Committee was established. The Committee, composed of concerned citizens, meets monthly with DEM and advises the Department on the management and operation of the Forest. The Advisory

Public Participation: (continues)

Committee was also a co-sponsor with the Department of a public meeting before initiation of the planning process. This meeting gave citizens the opportunity to have input that helped to shape the plan. A second public meeting will be held to review the draft plan to ensure that public concerns are addressed and to inform the general public of the plan's management recommendations. A final plan will be developed, incorporating input from the Advisory Committee and the public meeting on the draft.

Period Evaluation and Update: the recommendations in this GOALS plan will be periodically reviewed and updated, as necessary, to consider changes in the natural and man-made resources and recreational demand upon the Forest. Public input will be solicited.

To conduct the GOALS planning process, DEM has assembled a core team of personnel including a planner, foresters, regional and assistant regional supervisors, and staff from Willard Brook State Forest, the administrative headquarters for the Forest. This core team is directly responsible for developing the plan. Assistance was obtained from a secondary team when needed. On the secondary team is a landscape architect, interpretive specialist, fire warden, insect pest control supervisor, and individuals from other agencies such as the Division of Fisheries and Wildlife. Input also was solicited from many private people including members of the Advisory Committee.

There are several benefits of this team approach, the most obvious being the wealth of expertise that is provided to the planning process. It is also important to note that the managers of the Forest (Willard Brook supervisor and regional supervisor), who are responsible for plan implementation, are intimately involved in the plan preparation. Thus, a strong tie between plan development and implementation of plan recommendations is created.

The GOALS planning process for J. Harry Rich State Forest is a major task, requiring input from many state professionals and concerned citizens. Guidelines will be established that will spell out the objectives for the management, expansion, use, and protection of the Forest. In the next section, DEM will be described with emphasis on the Division of Forests and Parks and the Division of Planning and Development which are the two DEM units responsible for GOALS plans.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (DEM)

DEM is responsible for the management of 250,000 acres of land and water in the Commonwealth, protecting and enhancing their recreational use, and developing sound land use plans and policies for the enjoyment of these resources.

DEM DESCRIPTION (continues)

DEM is one of five departments within the Executive Office of Environmental Affairs. It was created in 1974, succeeding the former Department of Natural Resources. The Department has custody of nearly all state-owned forests, parks, rinks, pools, beaches, flood management areas, timber lands, and reservations outside the Metropolitan District Commission (MDC) Parks areas. DEM facilities meet the outdoor recreational demands of more than 12 million people each year.

The Commissioner of DEM supervises four major units concerned with different phases of resource management: the Division of Forests and Parks, the Division of Planning and Development, the Division of Water Resources, and the Division of Waterways. Since the Division of Forests and Parks and the Division of Planning and Development are directly involved in this plan, these units will be described in detail.

DIVISION OF FORESTS AND PARKS

The Division of Forests and Parks manages more than 170 forests, parks, reservations, rinks, and pools throughout Massachusetts that comprise the seventh largest forest and park system in the nation. The diversity of the Massachusetts Landscape is represented and exemplified by the State Forest and Parks system. Examples of various types of areas within this system include coastal and freshwater beaches, mountains, forests, serene natural areas, and historic sites. In addition, the urban Heritage State Park system, which includes parks in eight urban areas, provides much-needed parks in the cities, encourages associated development and revitalization, and provides opportunities for the public to gain an appreciation of the heritage of some of the Commonwealth's urban centers.

Besides public forest and park management, the Division is also actively involved in forest management on public and private lands (Bureau of Forest Development), forest fire protection (Bureau of Fire Control), insect control programs (Bureau of Insect Pest Control), and urban services (Bureau of Urban Services).

Five forests and parks regions have been established within the Division: in the Southeast (Region 1), Northeast (Region 2 - Middlesex and Essex Counties), Central (Region 3), Connecticut Valley (Region 4), and the Berkshire (Region 5).

Each region has a regional supervisor who is responsible for region management and reports to the Director of the Division. In turn, the forest and park supervisors, who are responsible for individual forest and park units, report to the regional supervisor for their region.

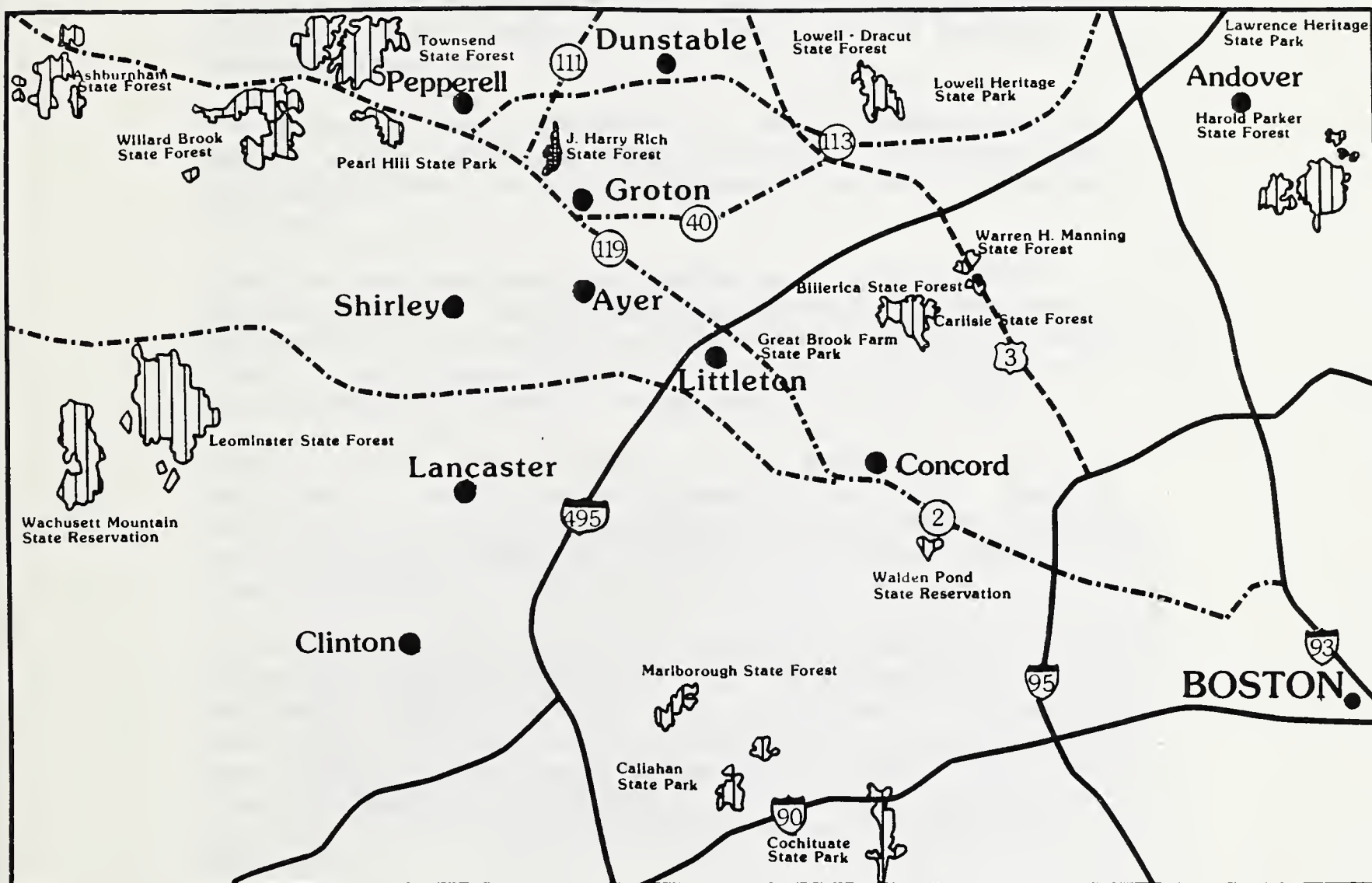
DIVISION PLANNING AND DEVELOPMENT

This Division helps generate policy initiatives for the Department's recreation and conservation activities; plans, designs, and implements facility improvements; and acquires and administers real property. Headed by the Deputy Commissioner for Planning and Development, this Division is divided into three Bureaus: Bureau of Planning, Bureau of Real Property and Legal Affairs, and the Bureau of Engineering.

The Bureau of Planning includes several programs designed to promote the provision of quality open space opportunities and protect Massachusetts' environment. Program efforts are aimed at protecting scenic rivers, important natural, scenic, and unique landscapes; city and town commons renovating, statewide recreation planning; trail planning; and providing handicapped access.

LOCATION OF J. HARRY RICH STATE FOREST

J. Harry Rich State Forest is located near the New Hampshire border in the Town of Groton, in northwestern Middlesex County. The Forest abuts the Nashua River, which serves as the border between the towns of Groton and Pepperell. The main entrance to the Forest is located at the corner of Nod Road and Common Street, both of which intersect with Route 119, the main north-south by-way through Groton. Also coming from the south is Route 111 which joins Route 119 then heads off to the northeast towards Pepperell. Route 40 comes from the east and stops of the Groton Town center. Major highways in the vicinity of the Forest include I-495 to the south and Route 3 to the east. Lowell, is the closest, city is 12 miles to the east. Boston lies to the southeast and Worcester to the southwest, approximately 40 and 35 miles from the Forest, respectively. (See Locus Map)



J. HARRY RICH STATE FOREST

Guidelines for
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LOCUS

LEGEND

-  J. Harry Rich State Forest
-  D.E.M. Forests and Parks
-  Interstate Highway
-  State Route
-  U.S. Route

HISTORY OF THE J. HARRY RICH STATE FOREST

Purchased by the Department in 1981, the J. Harry Rich State Forest is comprised of 507 contiguous acres, of which 140 acres are submerged by the Nashua River. Since the 1890's, this area has had several owners who have used the land as a tree farm.

When the first white traders and settlers began to arrive in the area around 300 years ago they found the region was settled by the Nashua Indians who were members of the Algonquin Tribe. The Nashua River is named after this tribe. One commonly accepted translation of the Nashua is "the river with the beautiful pebbled bottom".

The settlers located their settlement, called Petapawas by the Indians, within the current Forest boundaries. They traded with the Indians, fished for shad and salmon in the river and farmed the land.

The river was once the main transportation route for early settlers, but soon a stage coach road was built between Boston and Keene, New Hampshire that crossed the property and forded the river. A cellar hole within the Forest is all that remains of Nod Tavern which probably served many a weary traveler.

When the railroad was introduced to the area, it was supplied with fuel at a loading station adjacent to the Forest. Much of the fuel for the train was produced within the present Forest as evidenced by the remains of some circular charcoal pits (50 to 80 feet in diameter).

The main settlement remained for about 100 years before moving to its present location on higher ground, one and one half miles to the south. Despite this move, the area continued to be actively farmed into the 1860's and was sometimes known as the "Land of Nod," implying that it was a distant, far off place. After the Civil War some of the surrounding area began to revert back to woodland, but was retarded by grazing, fires and charcoal production.

HISTORY OF J. HARRY RICH STATE FOREST (continues)

The property (445 acres) which is now part of J. Harry Rich State Forest was eventually purchase by the Lawrence family; and, in 1890, they created a small White Pine plantation. In 1918, a dam on the River was constructed in East Pepperell and the lowland areas along the River were flooded which raised the water table. Five years later, in 1923, Professor J. Harry Rich, a professor - emeritus of Forestry at the University of Massachusetts, acquired the property and add 36 acres in 1946 and another 26 acres in 1952. Through forest management, he established a large forest of predominantly White Pine.

In 1956, the Forest, under Professor Rich's ownership, was dedicated as a certified Tree Farm. In 1959-1960, a portable sawmill was set up in the Forest which cut 300,000 board feet of lumber.

The Forest continued to be managed by Professor Rich until his death in 1964, when the title was transferred to the Rich Tree Farms and Forestry Corporation. Under both Professor Rich's and the Corporations ownership, the Forest was silviculturally managed producing nearly 4 million board feet of timber and 2,000 cords of fuel wood.

The J. Harry Rich State Forest is now managed by the Department of Environmental Management's Division of Forests and Parks.



A Stand of White Pine

ROLE OF THE J. HARRY RICH STATE FOREST

The location and past management of J. Harry Rich State Forest help define the Forest's role as open space in Middlesex County. The proximity of the property to the Nashua River makes it as an access point to the River for various river related recreational activities. The Forest also serves as an important link in the Nashua River Greenway in terms of helping to provide river protection preserve the scenic character of the River, provide flood storage and protect both animal and plant habitats.

Both the history of intensive forest management at J. Harry Rich and its tree farm status provide a great opportunity for the Forest to be used as a demonstration and interpretive area where good forest management practices can be exhibited to the general public.

There are several existing and potential trails at J. Harry Rich. The woods road network at the Forest is used by a variety of passive trail recreational interests including hiking, horseback riding and nordic skiing. The Department has acquired the abandoned B&M Railroad Right-of-Way (ROW). It forms the eastern boundary of the Forest and will offer long distance trail opportunities. An access point along this ROW will be determined. The Department would like to provide parking and visitor center facilities at this access point.

In addition to the above functions, the Forest also serves as a habitat for a variety of wildlife and plant life. The river and floodplain ecosystem along with woodlands offer a variety of habitats that support a diversity of plant and animal species.

PLANNING ISSUES AND OPPORTUNITIES

Through the planning process, public meetings and discussions with the Citizens Advisory Committee and other interests, a number of issues and opportunities were identified which have been addressed in this GOALS plan.

These issues include:

- Forest management: How to manage the Forest so that White Pine continues to predominate and what techniques to use in order to achieve this goal?
- Forest recreational development: What types of recreation should be encouraged or discouraged within the Forest?
- Interpretation of the Forest: Other than being interpreted as a Demonstration Forest, what other aspects of the forest could be interpreted?
- Trail use, design and management: How should various trails be used as well as designed and managed in order to both accommodate and enhance these uses?
- Land acquisition and land protection: What opportunities may be available to further protect the Nashua River and the Forest?
- Ayer to Hollis Depot abandoned B&M Railroad Right-of-Way (ROW): What should be allowed how should the trails and culverts be designed to accommodate these uses?
- Wildflower protection and cultivation: What areas containing wildflowers are worthy of special protection?
- Forest security and protection: What types of law enforcement and protection can be used?

PLANNING ISSUES (continues)

- Former Groton Town dump adjacent to the Forest: Should DEM acquire this site and how could it be used if acquired?
- Wildlife management: How can wildlife be protected and habitat enhanced as well as managed?
- Tree farm status: How to use the Forest in ways that are compatible with its tree farm status?
- Management of islands in Nashua River: How to use, protect and manage these islands?
- Future facilities development: What facilities are needed in order to accommodate Forest and ROW users, equipment and personnel?
- Cultural Resources: Where are the cultural resources and what is their historic significance?

Chapter Two

Regional Context

REGIONAL DESCRIPTION AND HISTORY

J. Harry Rich State Forest lies in the Northeastern region of Massachusetts in the Town of Groton and adjacent to the Town of Pepperell. This area, which was settled around 1650, was predominately used for agricultural purposes. While farms remained active during the 1800's, much of the economy of the area was associated with manufacturing. For example, Pepperell was known for its paper industry having its first large mills built in the early nineteen century. Manufacturing industries now rank first in Pepperell and second in Groton as the leading sources of employment.

This region has faced increased development in the twentieth century, particularly in the form of residential development. Much of this increase can be attributed to the growth of local and regional industries, and the development of an improved transportation network (Route 495, for example). Taking these population increases into account, both the Groton (1987) and Pepperell (1982) Open Space Plans recognize the need to manage and control future population growth in order to retain the rural character of these communities.



Canoeing on the Nashua River

TOWN DESCRIPTIONS

GROTON

The J. Harry Rich State Forest lies in the northwest corner of the Town of Groton. Groton contains over 33 square miles and had a 1980 population of 6,093. The population of the Town increased by roughly 19 percent between 1980 and 1987. (See Table 1)

Table 1: Population Figures

<u>Town</u>	<u>1980</u>	<u>% Change</u>	
		<u>1987</u>	<u>1980 - 1987</u>
Groton	6,093	7,276	+ 19%
Pepperell	7,976	9,086	+ 14%

Source: Groton and Pepperell Census Figures

Population projections - The latest population projections which were published in 1984 by the Massachusetts Department of Commerce don't accurately describe the present rate of growth in the two towns. Population projections need to be updated.

Groton, which was incorporated in 1655, was primarily an agricultural community during Colonial times to the Civil War. Saw and grist mills erected along the Nashua River catered to the local farming population. Today, Groton is a suburban community that has retained many of the old rural New England town characteristics. Currently, the leading sources of employment are service industries; with manufacturing (paper, office machinery, electronic equipment), is second and government, third. Two exceptional educational institutions, the Lawrence Academy and the Groton School, play a major role in the Town's economy. In 1983, the average labor force in Groton was 1,523 persons. Two exceptional educational institutions, the Lawrence Acaemy and the Groton School play a major role in the Town's economy.

PEPPERELL

Although the J. Harry Rich State Forest does not lie in the Town of Pepperell, it is important to investigate the character of the Town since Pepperell abuts the Forest on the north and lies across the Nashua River to the west.

Pepperell contains 23 square miles and had a 1980 population of 7,976. The population of the Town increased by roughly 14 percent between 1980 and 1987. (See Table 1)

TOWN ZONING

GROTON

Most of the land adjacent to J. Harry Rich State Forest is zoned Residential-Agriculture (R-A district). The R-A district is intended for single-family homes and for the continuance of forestry and agriculture practices. The minimum lot area is 80,00 square ft. plus an additional 10,000 square ft. per bedroom. Also adjacent to the Forest, are the conservancy and open space districts. Some of the uses allowed here are: churches, nurseries, public schools, and farming. A business district lies to the the south and allows retail stores, services establishments, business or professional offices, and restaurants. A minimum of 40,000 square feet is needed to build here in the business district.

Because the Nashua River forms the westerly boundary of J. Harry Rich, many areas in and around the Forest are susceptible to flooding. These areas are within Groton's Flood Plain District where, the erection of buildings and structures is prohibited. (see Hydrology map, 100 year flood plain zone)

The rural quality of Groton is, in part, created by low density (two acre) zoning throughout most of the Town. Approximately 70 percent of the Town's acreage is forest land; 15 percent is agricultural or open land; 6 percent is wetlands and .5 percent of one is used for recreation. Only 9 percent of Groton is urbanized.

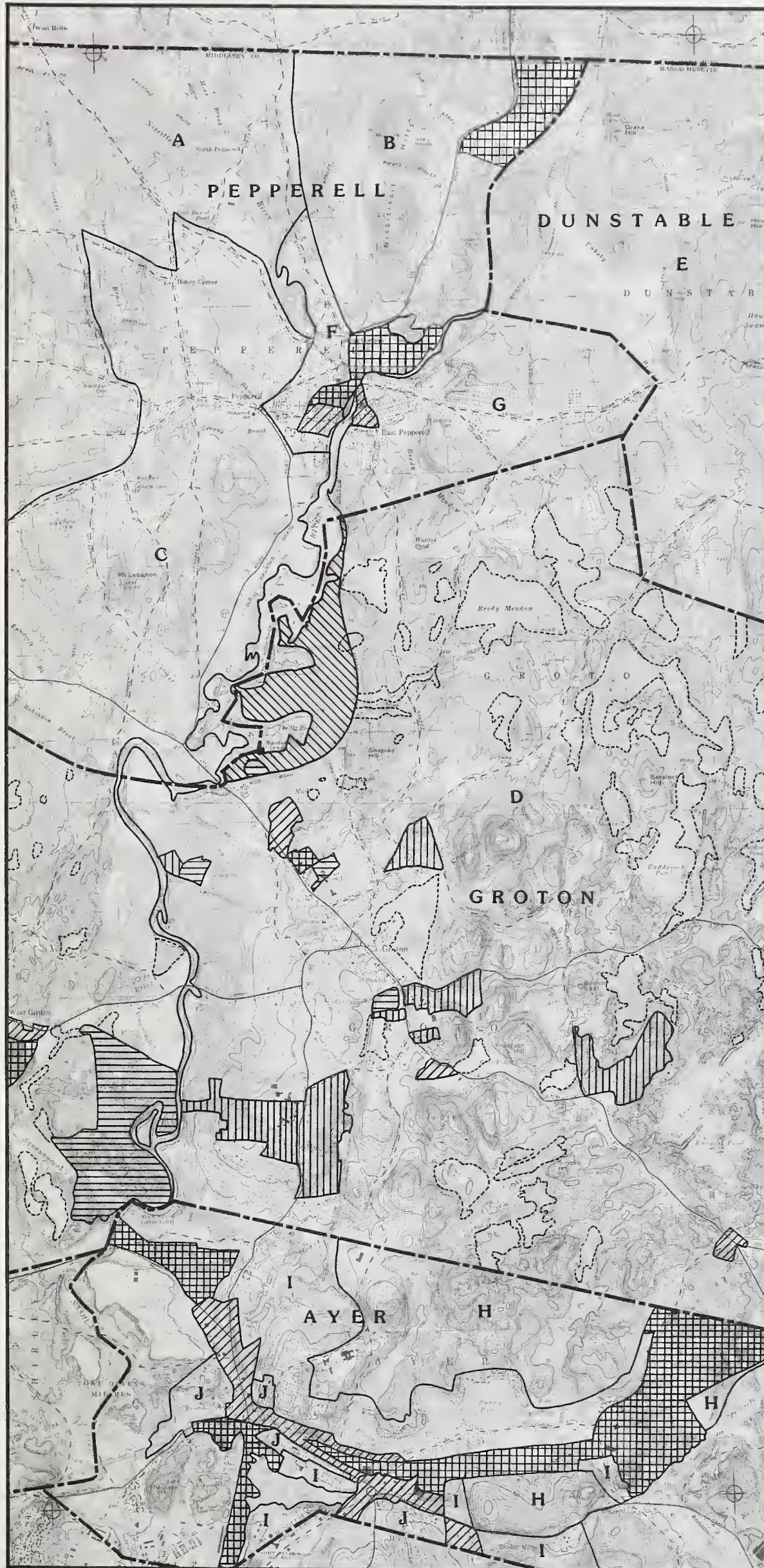
PEPPERELL

The largest zoning district near the Forest is the Town Residence zone; it lies across the Nashua River. A minimum of 80,000 square feet is required to build and some of the uses allowed include single family homes, places of worship, governmental administrative buildings, and public schools. Another zone exists in Pepperell called the Rural Residence (R-R) zone. Although it is similar in many ways to the Town Residence zone, it, in addition, allows such uses as dairy, poultry, and livestock farms. The zone directly west of the Forest requires 80,000 square feet per housing unit.

A Suburban Residence zone lies to the north and allows a number of uses including single-family homes, nurseries, and market gardens. This zone requires a minimum of 40,000 square feet to build. Pepperell's Urban Residence zone also requires a 40,000 square foot minimum and allows both single-and two-family housing, boarding/lodge housing, and nursing homes. The Commercial and Industrial zones do not require a minimum lot area. These districts are intended for retail and local neighborhood shopping, offices, and a variety of manufacturing uses.








Pepperell, incorporated in 1753, was initially and primarily an agricultural community. During the winter months, its farmers made barrels for the Boston market. Pepperell achieved early recognition, however, for the quality and scope of its paper industry. The first large mills were built in the early 1800's. The H.A. Parker Company manufactured wrapping paper, leatherboard and batting. The most noted manufacturer was the S.D. Warren Company, who became entrepreneurs in the manufacturing of tinted paper in 1862. Other early industries included a carding and clothier's mill and, for a brief period, a shoe factory. Rags from all over the world were shipped to Pepperell on the RR line, as raw material for the paper industry. Today, manufacturing industries contribute the most to the economic base of the Town, with the paper and allied products industry being the largest manufacturing group. The second highest employment category is services and the third is the retail field. The labor force in Pepperell was an average of 947 persons in 1982.

Like Groton, the rural quality of Pepperell is, in part, created by low density (two acre) zoning throughout most of the Town. Approximately 45 percent of the Town's acreage is rural, which includes agriculture and forest land; 30 percent is owned by the Town Conservation Commission and other Town departments; 11 percent is in recreational use; and 14 percent in suburban, urban, commercial and industrial use.



Regional Land Use

LEGEND

-  J. Harry Rich State Forest
-  Industrial Zones
-  Commercial Zones
-  Institutional Properties
-  Open Space Zones
-  Conservancy District
-  Residential Zones

80,000 square feet

- A. Rural Residential
- B. Recreational Residential
- C. Town Residential
- D. R-1 Residential

40,000 square feet

- F. Urban Residential
- G. Suburban Residential
- H. A-1 Residential

12-15,000 square feet

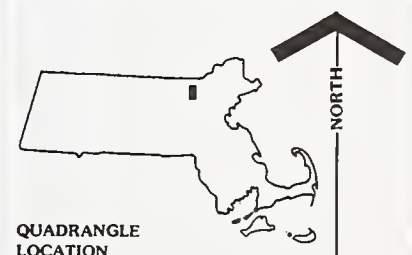
- I. A-2 Residential

10,000 square feet

- J. GR- General Residential

J. Harry Rich State Forest

Guidelines for
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QUADRANGLE
LOCATION

0 2000 5000 10,000 FT

PREPARED BY THE
MASSACHUSETTS DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

ADJACENT LANDS

PROTECTED OPEN SPACE

Protected open space in the area around J. Harry Rich is under federal, state, local or private and non-profit ownership. Most of this land is open to the public and offers, at least, passive recreational opportunities. There is a significant amount of open space in the direct vicinity of the J. Harry Rich State Forest, the Nashua River, and the Ayer-Hollis Railroad Right-of-Way, which the Department of Environmental Management has recently acquired. The following discussion of open space and conservation lands focuses primarily on the protected open space parcels adjacent to or near the Right-of-Way as well as with other parcels adjacent to or near both the Forest and the Nashua River. This plan investigates potential linkage between these open space parcels and the Forest and the Right-of-Way via trails or the Nashua River. The location of the open space lands are identified on the Regional Context map.

Groton (See Regional Context map)

Protection of open space lands in Groton is managed by the Town Conservation Commission, other Town departments, or the Groton Conservation Trust, a private non-profit group.

The Conservation Commission manages two parcels of land directly east of the forest that abut the Railroad Right-of-Way. One parcel noted as G-40 is a 44 acre area adjacent to the Longley Estates. The other (G-22) is a 100 foot wide conservation restriction that is contiguous to the Right-of-Way across from the northern tip of the Forest. This restriction is monitored by the Conservation Commission and was procured through the Longley development. Also, to the east of the Forest but not adjacent to the right-of-way, is the Wattles Pond Conservation Area that is managed by the Groton Conservation Trust. This area (G-23) consists of 42 acres of pond and surrounding woodland that is protected as a Wildlife Sanctuary and is accessible from Longley Street.

There are a number of open space parcels located to the south of the Forest that are important due to their proximity to the Forest, the Nashua River, or the Railroad Right-of-Way. The former Groton Town dump (G-16), which is a total of 18 acres, abuts the Forest to the south along the Nashua River. The Dump is contaminated with hazardous materials at the present time but, hopefully, it will be cleaned up in the future. Also, along the Nashua River is the Petapawag Canoe Launch site (G-15), a three acre parcel managed by the Conservation Commission that serves as a popular launching area for canoes and boats. It is a historic area, the site of an original American Indian settlement and later a mill. Just south of Route 119 and along the Nashua is a one and one-half acre strip known as the James River Greenway (G-14) that is managed by the Conservation Commission.

Another parcel along the River under the Conservation Commission's jurisdiction is the Farmers and Mechanics Club site (G-8) which is about nineteen acres and has a walking and riding trail. The Amory A. Lawrence Playground (G-19) abuts the Railroad Right-of-Way near Broad Meadow Road and has ballfields, basketball and tennis courts, and a picnic grove on its fourteen acres. South of the playground is the Bates Conservation Land (G-20) which is nearly 39 acres of fields and woods along the James Brook and Old Ayer Road. Managed by the Groton Conservation Trust, this parcel has a trail up Indian Hill that offers excellent views.

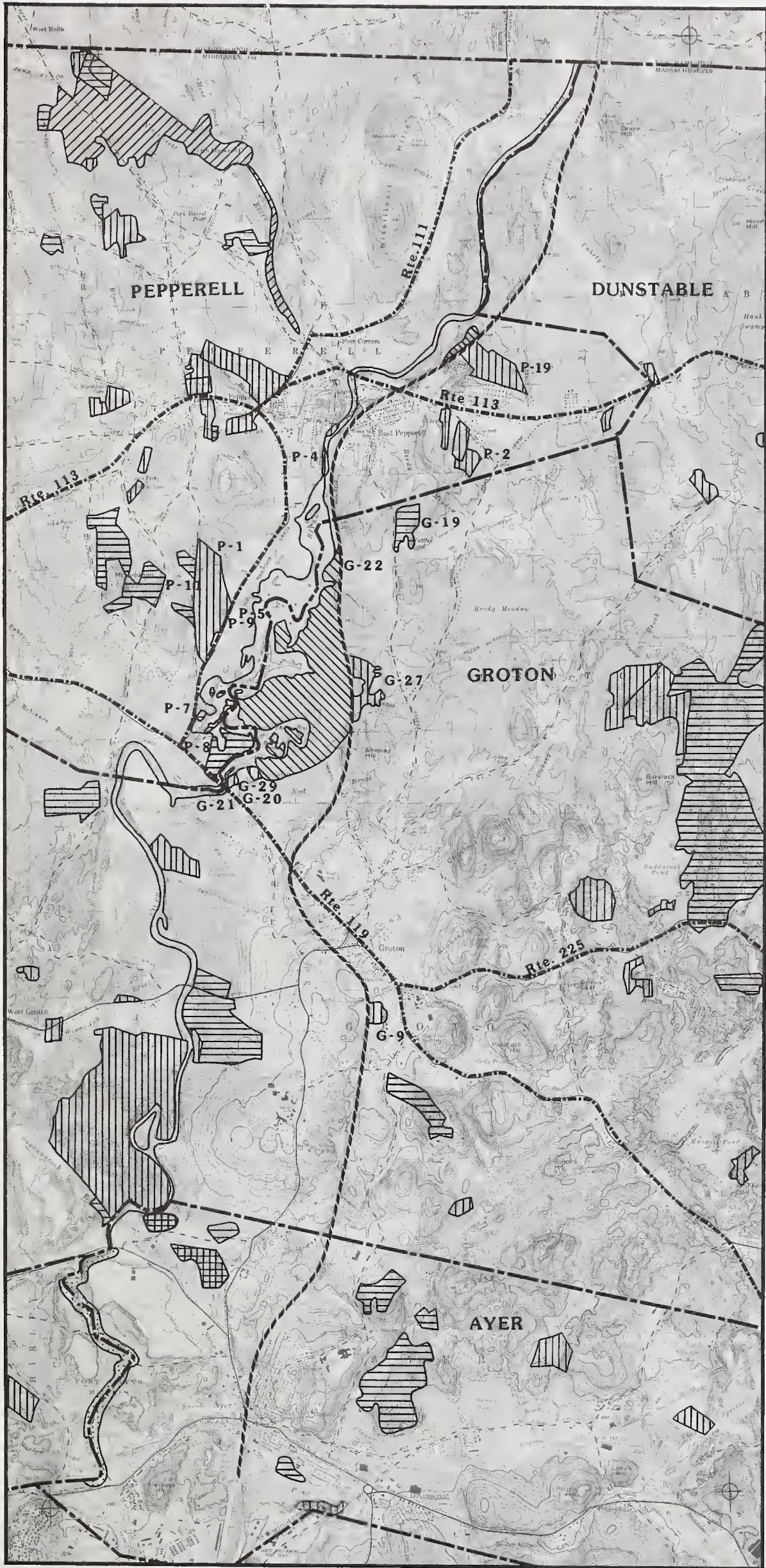
Pepperell

The most significant protected open space lands in Pepperell with respect to the J. Harry Rich State Forest are across the Nashua River. They are significant because they provide both protection of the natural visual resource along the River and some public access to the River. These lands are managed/monitored by the Town Conservation Commission, other Town departments, or the Nashoba Conservation Trust.

Proceeding south to north along the Nashua River is a thirty-four acre parcel of Route 119 (P-8) known as Yapp Hayfield which is encumbered by a conservation restriction held by Nashoba Conservation Trust. The conservation restriction does not provide public access to this land. North of Yapp Hayfield is a four acre parcel (P-7) off River Road and crossed by an old railroad grade which is managed by the Pepperell Conservation Commission.

Further north along the Nashua is a 100 foot deep buffer strip protected by a conservation restriction (P-9) which is adjacent to the River. This buffer strip abuts the John Kemp Conservation Area (P-5) and is managed by the Conservation Commission. Comprising 1.4 acres, this Conservation Area provides a canoe launch on a wooded peninsula. Between River Road and Elm Street across from the conservation restriction is the eighty-three acre Town Forest (P-1) which is managed by the Town Forest Committee for timber and picnicking. The Nashoba Conservation Trust manages thirteen acres of woodland in two separate parcels (P-11) across Elm Street from the Town Forest.

Just south of East Pepperell and the James River Paper Company dam are slivers of land (P-4) between the Nashua River and Canal Street. These parcels include roughly one and one quarter acres of land that is managed by the Conservation Commission. The last parcel of interest in Pepperell is a 24 acre parcel (P-2) off Jersey Street just north of the Pepperell/Groton town line. This land is managed by the Town Water Department and Recreation Commission and includes the Jersey Street well and playground. Continuing north, there is a 25.6 acre parcel (P-19) that abuts the Railroad Right-of-Way to the east which is owned by the Conservation Commission.



Regional Context

LEGEND

Protected Open Space

FEDERAL

Ft. Devens

STATE

Mass. Dept. of Fisheries, Wildlife and Environmental Law Enforcement

Mass. Dept. of Environmental Management

DEM Rails Trail

Ayer State Game Farm

MUNICIPAL

Ayer, Dunstable, Groton or Pepperell

PRIVATE

Non-Profit Organizations

Boundary

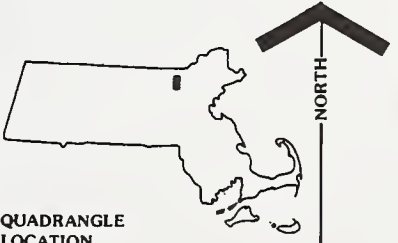
Town Boundary

Access

State Routes

J. Harry Rich State Forest

Guidelines for Operations And Land Stewardship



QUADRANGLE LOCATION



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POTENTIAL AND EXISTING PROBLEMS

There are several potential problems on the lands adjacent to or near the J. Harry Rich State Forest. These include pollution sources, eyesores, or a combination of the two.

Nashua River

- * Any development of the opposite shore of the Nashua River will be visually intrusive to the present rural character of the shoreline.
- * Seepage from septic systems and leakage from manure piles and stables in the area can cause water quality problems.
- * Although the former Groton Town Dump has been capped, leakage from the site into the Nashua River and tributaries could be a serious problem.
- * Upstream pollutants including sediments carried by the Nashua River to the Pepperell Pond area is a problem.
- * Eutrophication of different areas of the Nashua River is a problem.
- * (It is believed that some of the water quality problems in the Nashua River will be alleviated when the severely overloaded MDC sewage treatment plant in Clinton is replaced.)

Other Areas

Development of Nod and Sand Hill Roads and between the railroad bed and Longley Street will detract from the wooded character of the area.

DEVELOPED LANDS

The land around J. Harry Rich State Forest is rapidly developing for residential use as seen in the area between the railroad bed and Longley Street. There also appears to be an availability of prime residential development land to the south of the Forest as well as land on the opposite shore of the Nashua River in Pepperell. Fortunately, the area around the Forest in the Towns of Groton and Pepperell is zoned for low-density residential use rather than for commercial, industrial, or business use which could possibly have an adverse visual and/or environmental impact on the Forest.

Chapter Three

Existing Conditions

NATURAL RESOURCES

CLIMATE

Located in the Eastern Upland Region of Massachusetts, J. Harry Rich State Forest is subject to a variable temperate climate characterized by mild summers and cold winters. Normal air temperatures in Groton are 73.6° F in July and 26.7° F in January.

Because of its proximity to the Atlantic ocean (approximately 40 miles) the Forest is exposed to periodic tropical storms and "northeasters". Less frequently, hurricanes may move into the region and cause considerable tree damage from strong winds and flooding.

Average annual precipitation in Groton is 42.63 inches; the averages snowfall is 55-60 inches. Winds are predominately from the west. Fog that originates from the Nashua River is often present in the Forest.

GEOMORPHOLOGY

Geomorphology is the geologic study of the configuration and evolution of land forms which determine the nature of the topography, soils and hydrology of the Forest.

J. Harry Rich State Forest is undistinguished by significant topographical features. The Forest is a low-lying area, gently sloping from the highest elevation of 245' (at the Railroad Right-of-Way) to the edge of the Nashua River (elevation, 200').

The current landform of the Forest was created by the southerly movement of the glacier that covered much of New England as recently as 12,000 years ago. Most of the Forest soil is a form of glacial drift known as glacial outwash. Glacial outwash deposits characteristically were transported and deposited into lowlands such as those found at the Forest. It is primarily composed of loamy sand and, in addition, sandy loam which is fine textured and provides a high level of permeability for surface drainage.



Eroded Woods Road

SOILS

As previously mentioned, J. Harry Rich State Forest is located on a glacial outwash plain and on the flood plain of the Nashua River. The uplands are generally loamy sand or sandy loam soil, underlaid by stratified sands and gravel, while lowlands are generally mucky, loamy soils.

Soil type along with water table level and slope are major limiting or influencing factors in determining appropriate uses for the Forest. Table 2 provides a list of soil types and their corresponding limitations. The Soils Map shows the location of the soil types and highlights those soils at the Forest that have severe development limitations due in part, to both the construction of the Pepperell Dam and seasonal flooding. The only soils that have slight to moderate limitations on development for buildings and recreation are the Windsor and Sudbury types.

Soil types also influence forest management by affecting regeneration and growth of trees. In general, rapidly permeable soils lend themselves to pine regeneration, while poorly drained sites tend to regenerate more towards mixed pine hardwood stands.

The following soil information is general in nature and is useful in guiding assumptions, yet site-specific study is required where roads, trails, and recreational facilities are contemplated.

Table 2

SOIL TYPES ON J. HARRY RICH STATE FOREST

Source: USDA, Soil Conservation Service, 1982. N.E. Mass.
Interim Soil Survey Report. SCS Office,
Littleton, MA 137p.

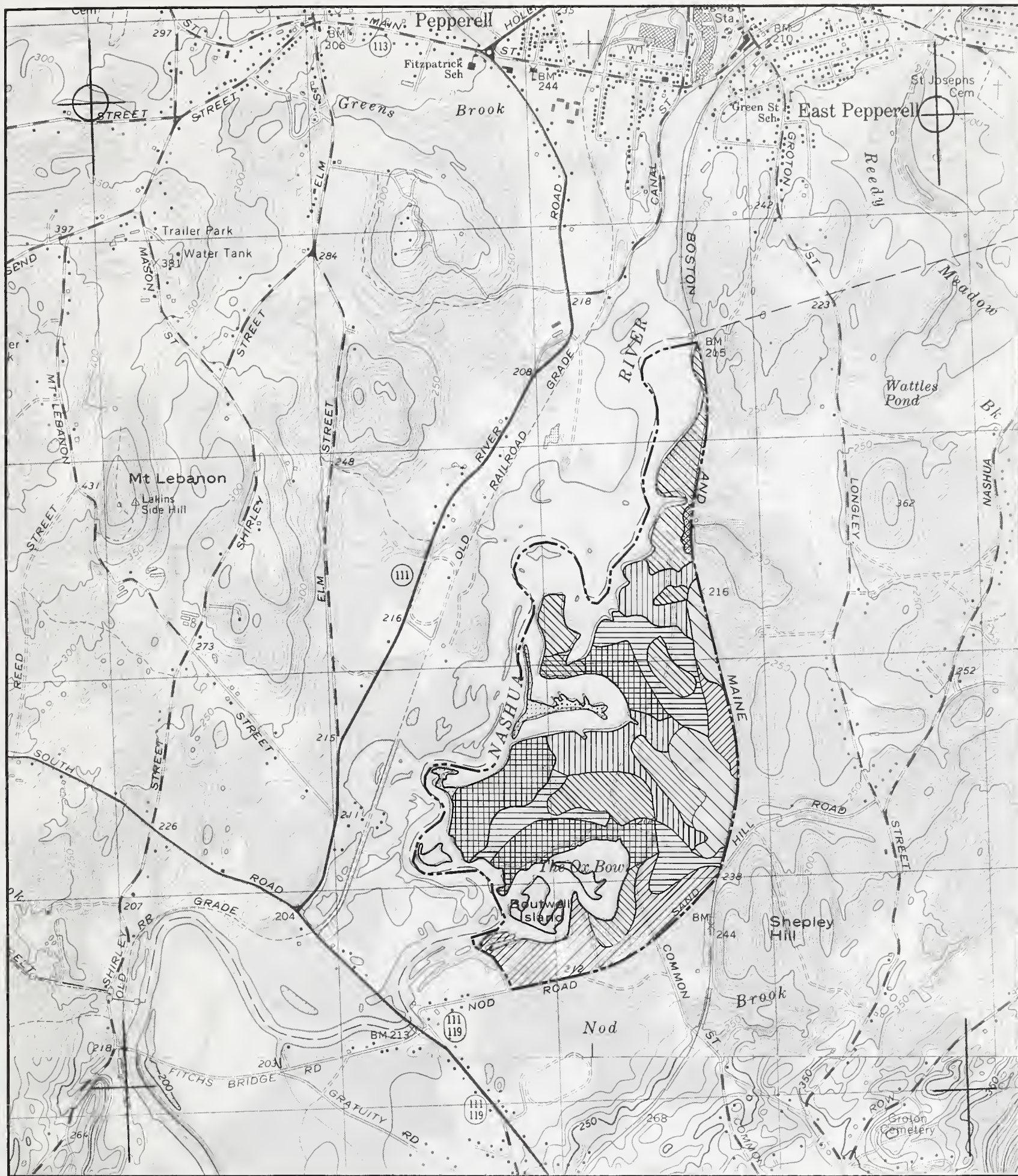
Soil Type	Soil Description
Windsor	Windsor series consists of nearly level to very steep, deep, excessively drained soils on glacial outwash plains, terraces, deltas and escarpments. They formed in sandy glacial outwash. Windsor soils have very friable or loose loamy sand or loamy fine sand surface soil, very friable or loose loamy fine sand to sand subsoil over a very friable or loose sand or fine sand substratum at 20 to 32 inches. They have rapid permeability. Major limitations are related to droughtiness and slope.
Sudbury	Sudbury series consists of nearly level and gently sloping, deep, moderately well-drained soils in depressions on glacial outwash plains and terraces. They formed in water-sorted sandy and gravelly materials. Sudbury soils have fine sandy loam and sandy loam surface soil and subsoil which has moderately rapid permeability, over loose, stratified sand and gravel substrata at 18 to 30 inches which has rapid permeability. They have a seasonal high water table at 18 to 24 inches. Major limitations are related to wetness.
Walpole	Walpole series consist of nearly level and gently sloping, deep, poorly-drained soils on glacial outwash plains and terraces. They formed in sandy glacial outwash. Walpole soils have friable fine sandy loam or sandy loam surface soil and subsoil with moderately rapid permeability over a stratified sand and gravel substratum at 18 to 28 inches, with rapid or very rapid permeability. They have a high water table at 0 to 18 inches, 7 to 9 months of the year. Major limitations are related to wetness.
Scarboro	Scarboro series consists of nearly level, deep, very poorly drained soils in depressions of glacial outwash plains and terraces. They formed in sandy glacial outwash. Scarboro soils have muck, mucky sandy loam or mucky loamy sand surface soil, over stratified

Scarboro (continues)

sand and gravel at 3 to 16 inches. Permeability is rapid or very rapid. They have a high water table which is at or near the surface most of the year. Major limitations are related to wetness.

Occum Occum series consists of nearly level, deep, well drained soils on floodplains. They formed in recent alluvium. Occum soils have fine sandy loam or sandy loam surface soil and subsoil with moderately rapid permeability over a loamy fine sand to sand substratum at 20 to 40 inches with rapid permeability. Major limitations are related to flooding.

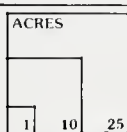
Saco Saco series consist of nearly level, deep, very poorly-drained soils on floodplains. They formed in recent silty alluvium that is high in organic matter. Saco soils have mucky silt loam or silt loam surface soil with moderate permeability, over a silt loam or very fine sandy loam substratum with moderate permeability, underlain at 40 to 60 inches by stratified sand and gravel with rapid permeability. These soils have a high water table that is at or near the surface most of the year and are frequently flooded. Major limitations are related to flooding and wetness.



J. Harry Rich State Forest

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LEGEND

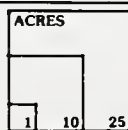
	38A-1 Sudbury Fine Sandy Loam		44A & A Saco Mucky Silt Loam
	39A-1 Walpole Fine Sandy Loam		67A- Windsor Loamy Sand
	40A-1 Scarboro Muck		67B-2 Windsor Loamy Sand
	41A-1 Occum Fine Sandy Loam		67C- Windsor Loamy Sand
	43A-1 Rippowam Fine Sandy Loam	SLOPE	
		A 0-5%	
		B 5-8%	
		C 8-15%	



J. Harry Rich
State Forest

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Equipment Limitation

LEGEND



Slight

Severe

HYDROLOGY

Hydrology Within the Forest

Research of current maps and data along with field visits revealed the following information about various hydrological aspects of the Forest including surface water, wetlands, groundwater and directions of surface drainage.

Although there are no ponds or lakes throughout the Forest, numerous unnamed brooks flow through and/or originate within the Forest. Wetlands occur in low-lying areas along the eastern section and adjacent to the Nashua River.

Groundwater concentrations beneath the Forest are considered to be moderate. A well is expected to yield 100-300 gallons per minute. Currently, there are no active wells within the Forest, although an old well site has been found. The water table, which is the depth below which groundwater saturation occurs, is variable throughout the Forest and depends on both season and location. In general, the water table is between 1-10 feet below the surface. (The addition of the Pepperell dam has raised the water table within the Forest to these levels).

Surface drainage is primarily determined by topography. The Forest land gently slopes from east to west directing drainage toward the Nashua River.

Nashua River

The Nashua River forms the westerly boundary of the J. Harry Rich State Forest. A unique feature of the Nashua River is that for over half its length it flows to the north, which is unusual for a river of its size. The river has a drainage area of 530 square miles, travels 56 miles, and falls 470 feet from its headwaters in Fitchburg to its confluence with the Merrimack River in Nashua, New Hampshire.

Since it was first harnessed for industrial power by the city of Nashua in 1660, the river has drawn numerous industries to its banks. In the early 19th century, paper manufacturing along with sawmills dominated the river basin, while today chemical, plastics, and fabricated metal firms are common industries.

Unfortunately, this industrialization has had a number of adverse effects upon the water quality of the Nashua River. Industrial discharges, untreated sewage, dams, and regional increases in population are just some of the contributing factors that have led to the river's degradation. Recent pollution control efforts by federal and state agencies, industries and businesses, municipal officials and citizen groups have, however, helped to improve the river's water quality. The Nashua River Watershed Association, in particular, has been a leading advocate in promoting conservation of the river's edge and raising public awareness on issues concerning the river.

Nashua River (continues)

Although the Massachusetts Department of Environmental Quality Engineering (DEQE) has designated the river for class B status as a goal for the river, the water quality still falls below class B standards. Class B water is designated for primary (swimming) and secondary (boating and fishing) contact recreation. Many dams and point and non-point sources of pollution have contributed to the river's pollution problems. For these reasons, both contact recreation and eating of fish caught in the river are not recommended.

Point Sources of Pollution

Located in the Nashua River basin, Fitchburg, contributes a portion of the industrial and domestic pollution that goes into the Nashua River. Since sewer and stormwater collection is combined, the treatment facilities malfunction during periods of heavy rain and often release untreated sewage. The waste water treatment plant in Clinton also has major problems in releasing untreated sewage. Ayer treatment plant also experiences periodic overloads. These discharges of untreated waste are one of the reasons why the upper Nashua frequently fails to meet Class B standards.

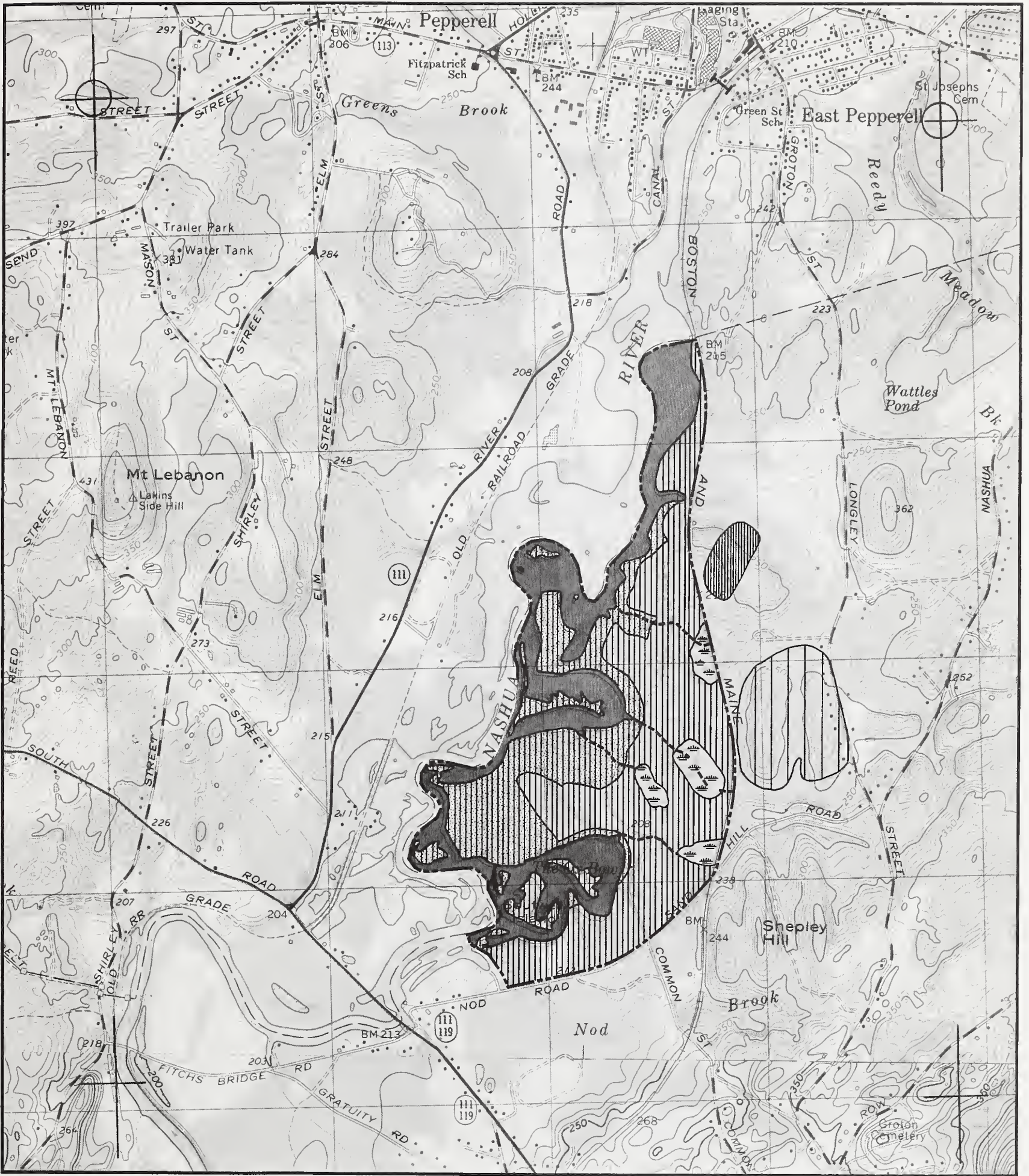
In addition to public sources of contamination, the private sector contributes to water quality degradation in the form of industrial and process wastewater.

Non-point Sources of Pollution

Another major source of pollution for the Nashua River is from non-point, diffuse (spread out) sources. The most prevalent source is from urban runoff. Stormwater in urban areas flows through parking lots, off rooftops, and out of roadside gutters and carries along with it large amounts of solids, oil, and grease. Also, rainwater percolates through the numerous dumps, landfills, and junkyards in the area causing water soluble pollutants from these sources to leach out and severely degrade the water quality of the river. Other non-point sources include agricultural runoff, highway salting, siltation, and erosion.

Dams

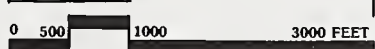
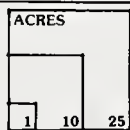
Of a total of 16 dams on the Nashua River, the Pepperell dam, which is less than a mile downstream from the Forest, is the closest one. This dam was built in 1918 and is controlled by the James River Paper Company. Damming the river at this point expanded the width of the river, flooding 140 acres of the Rich Tree Farm. The presence of a dam on a river has a number of adverse impacts which affect both hydrology and water quality. For example, the dam slows down the velocity of the river, creating a stagnant lake or pond behind it.



J. Harry Rich State Forest

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LEGEND

- Water Bodies
- Water Courses
- Wetlands
- Dam

100 Year Flood Zone

GROUNDWATER WELL YIELD

- 100 - 300 GPM per well
- Less than 100 GPM per well
- No yield expected

VEGETATION

J. Harry Rich State Forest is located within the transition hardwoods (Hemlock/White Pine) vegetative zone, as divided by the Silvicultural Committee of the New England Section of the Society of American Foresters in 1952. As the name implies, the transition hardwoods are a composite of two other zones: the northern hardwoods that occur to the west and south, and the central hardwoods that occur to the east and south. In the transition zone, the northern hardwoods grade into the central hardwoods which results in an increased variety of species. This zone is characterized by an overstory forest containing the below listed species:

Hardwoods

Red oak group

White oak

Red maple

Sugar maple

White ash

White birch

Yellow birch

Black birch

Black cherry

American beech

Hickory

American elm

Softwoods

White pine

Hemlock

Pitch pine

White cedar

Red cedar

Larch

The present stand composition and age is an indication of how intensely managed the Forest has been since 1923. The History of the Forest and plant succession are discussed in the forestry section.

Because of its former, use J. Harry Rich Forest contains almost exclusively White Pine in the overstory except for the wetter areas that contain primarily Red maple. Other plantations include Red Pine, Scotch Pine and Spruce. However, most of the above listed species do occur to a lesser degree in the State Forest.

Besides the overstory species of the Forest listed above, a wide variety of small trees, shrubs, grasses, and flowering plants in occur in the understory. Listed below, are some of the more common shrubs and ground cover species:

Witch Hazel	Sumac	White trillium	Blueberry
Poison Ivy	Purple trillium	Buttonbush	Winterberry
Lily of the valley	Pepperbush	Buckthorn	Canada lily
Speckled Alder	Dogwood	Solomon's Seal	Hop Hornbeam
Swamp Azalea	Lady slipper	Ironwood	Sheep laurel
Jewelweed	Gray birch	Huckleberry	Bunchberry
Chokeberry	Viburnums	Wild geranium	Shadbush
Ferns	Pipsissewa	Hawthorns	Goldenrod
Wintergreen	Partridgeberry		

Common species that exist in wet areas and along the Nashua River include:

Water lilies	Rushes	Watercress
Pickerelweed	Loosestrife	Water plantain
Arrowheads	Cardinal flower	Skunk cabbage
Cattails	Marsh marigold	Jack-in-the-Pulpit

Blue Flags

There are two areas in the Forest that are particularly special for the type or size of vegetation and deserve special protection through the land stewardship zoning classification or DEM policy. One is an area near the Railroad Right-of-Way (see the Zoning map) where there is a climax swamp type containing Hemlock and Yellow Birch Trees. This area is special because few swamps in Eastern Massachusetts have been allowed to retain this climax stage as most have been cleared, drained and used for agricultural purposes.

Another special vegetative area exists where there are stands of large White Pine Trees. (see the Zoning map in the Analysis Section Under Natural Resource Management Zone - Natural Area Subzone for the location). Though these pines are roughly the same age as other pine stands in the Forest, more favorable site conditions (soils, wetness) along with good management have contributed to the larger size and better health of these trees.

Much of the information for this vegetation section and the wildlife section that follows was gathered from a 1979 report titled: "The Nashua River Greenway/Pepperell Pond Area -- Recreation and Resource Inventory", prepared by Nancy Neilsen for the Rich Tree Farm Task Force. The intent of this document was to further acquisition of the tree farm by DEM and to promote conservation of the Pepperell Pond area of the Nashua River. Through this inventory, the tree farm was surveyed, the composition and distribution of vegetation was determined, and an assessment of the property as a wildlife habitat was made, as was a preliminary census of resident species.

Softwoods

White pine

Hemlock

Pitch pine

White cedar

Red cedar

Larch

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Ferns	Pipsissewa	Hawthorns	Goldenrod
Wintergreen	Patridgeberry		

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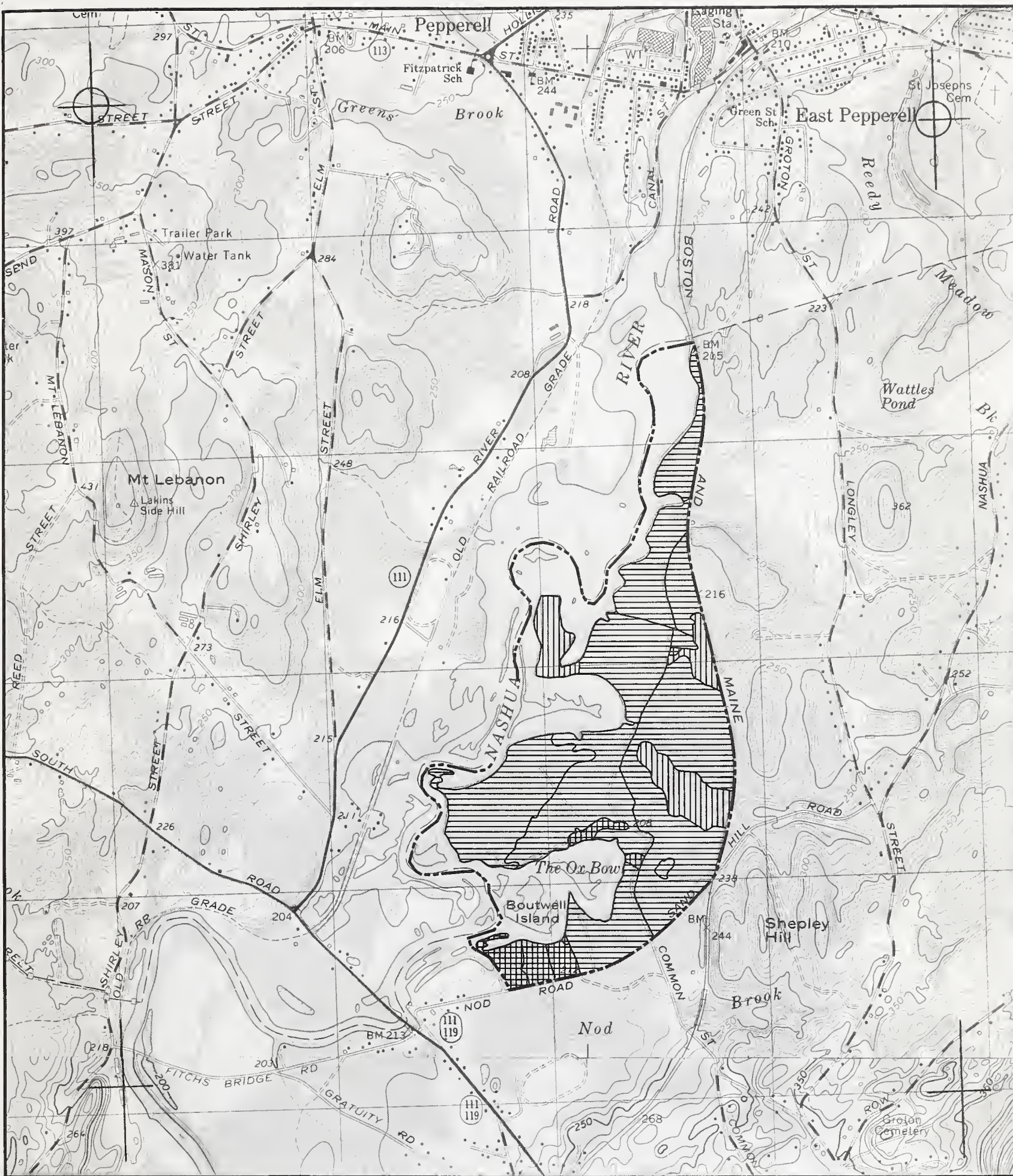
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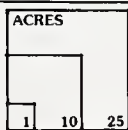
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Forest Types

LEGEND

- White Pine
- White Pine - Hardwoods
- Red Pine

WILDLIFE

J. Harry Rich State Forest offers many diverse vegetative habitats for wildlife. This diversity strongly correlates with potential wildlife value.

Because of its location on the Pepperell Pond area of the Nashua River, the Forest has a large "edge" section which supports a rich variety of plant and animal species. The extensive aquatic, emergent, and riparian vegetation zones of the Ox Bow and the river provide ample opportunity for a variety of animals. Blue herons, swallows, and turtles sunning themselves are common sights along the river.

The Forest itself, although predominately composed of 60-year-old White Pine stands, is not as uniform as one would think. There are interspersed, hand-planted plantations of younger Red and Scotch Pines and Norway Spruce, open canopy glades, swamps, and stands of mast producing hardwoods. In addition, many berry-bearing bushes in the understory help provide food for various songbirds and small mammals. (There have been reported sightings of turkey and a bobcat in the Forest.)

J. Harry Rich Forest is a popular duck hunting area although hunting of other game species is allowed as well.

A list of wildlife that may inhabit the Forest is provided in Appendix 2.



A Grey Squirrel Prepares For Winter

PHYSICAL FEATURES

PROPERTY BOUNDARIES

According to the deed, there are 506 acres in the J. Harry Rich Tree Farm, 140 acres of which are under water due to the creation of the Pepperell Dam.

The property boundaries of the Forest are physically well delineated: easterly by the railroad bed, northwesterly by the thread of the river, southwesterly by Nod Brook, and southerly by Nod and Sand Hill Roads. Such bounds help maintain the integrity of the Forest from encroachments.

TRANSPORTATION

Roads

The main entrance to the Forest is located at the corner of Nod Road and Common Street which both intersect with Route 119. A small woods road that is covered with gravel provides access to the Forest.

Parking Lots

The only parking area is located 1,000 feet from Nod Road beside the gravelled access road. This area accommodates approximately 20 vehicles. (There is a gate at the front entrance of the access road).

STRUCTURES AND UTILITIES

At the present time, there are no structures or utilities at J. Harry Rich State Forest.

FORESTRY

HISTORY OF MANAGEMENT

Most of the present J. Harry Rich State Forest, as was true of most of the surrounding countryside, was farmland from Colonial times until the mid-1800's. Cultivation was abandoned in the late 1800's as a result of both the Civil War and migration and settlement on more fertile land in the west. This abandonment allowed the land to revert back to forest.

Although some White Pine were planted by owners, during the late 1800's and early 1900's the land was generally unmanaged and neglected. Few of these trees survive today due to forest fires and the 1938 hurricane.

Much of the area formerly consisted of a vegetative cover of Pitch Pine, Scrub Oak, Grey Birch, Sheep Laurel, and Blueberries. This unproductive forest was the result of forest fires, heavy grazing, and heavy timber harvests which left little organic matter over a dry, sandy soil and resulted in a forest similar to the Pitch Pine, Scrub Oak forest found today over a large portion of Cape Cod and southeastern Plymouth County. There were also several undrained swampy areas that consisted of vegetative cover of almost exclusively Red Maple.

In 1918, the dam in East Pepperell was built which flooded roughly 140 acres of the present state forest. At the same time, the dam greatly increased the productivity of much of the remaining unflooded acreage by raising the level of the water table, which increased the accessibility of water to the root systems of the trees.

Dr. J. Harry Rich, a Townsend resident and professor-emeritus of Forestry at the University of Massachusetts, acquired 445 acres in 1923 another an additional 36 acres in 1946, and 26 acres in 1952. The Forest presently totals 507 acres.

J. Harry Rich, through very intensive management, established a forest of predominately White Pine which grew very rapidly due to the increased water table and favorable soil conditions. This resulted in today's high-quality stands of trees 55 to 60 years old. He cultivated White Pine stands over all but the wettest sections of the Forest and established a few acres of Red and Scotch Pines and Norway Spruce.

In 1956, the Forest, under Dr. Rich's ownership, was dedicated as a certified Tree Farm under the American Tree Farm System. It became the 15th certified Tree Farm in Massachusetts committed to the practice of proper forest management.

In 1964, the title was changed from J. Harry Rich to the Rich Tree Farms and Forestry Corporation. J. Harry Rich died in 1967, at which time Herschel J. Abbott, also a forestry professor at the University of Massachusetts, took over management of the property for the corporation. Under Dr. Rich's and the Corporation's ownership, nearly 4 million board feet of timber and 2,000 cords of fuelwood were harvested. In addition, most of the area had pre-commercial timber stand improvement (TSI) work done, including thinning and pruning. Five acre research plots were established for pruning and thinning to determine the effects and economic feasibility of these pre-commercial practices.

On January 16, 1981, the Forest was purchased from the Rich Tree Farms and Forestry Corporation by the Commonwealth of Massachusetts to be managed by the Department of Environmental Management, Division of Forests and Parks. In April of 1981, it was voted by the Directors of the American Forest Institute, who sponsor the Tree Farm Program, to allow the state to maintain Tree Farm classification. This was a landmark decision that made the J. Harry Rich State Forest the first state-owned Tree Farm in the nation.

Since state ownership, a complete "Forest Inventory and Stand Analysis" was done by Leupold Forestry Service with financial assistance from a generous grant from the Wharton Conservation Trust. Improvement work that has been done includes the sale of 30 cords of fuelwood from 8 acres and pre-commercial pruning and thinning on 30 acres.

MULTIPLE USE OBJECTIVES

The Division of Forests and Parks is committed to multiple-use objectives for lands under their jurisdiction. These objectives aim to provide the most services to the largest number of people while seeking to protect the Forest's environmental amenities. For example, most of the Forest has been designated under the Natural Resource Zone for the purposes of enhancing wildlife protecting water resources, providing recreational opportunities as well as offering sustained yields of forest products.

The forests of Massachusetts are very important in supplying raw materials for the Commonwealth's wood-using industry and for fuel as an energy source. According to the "Massachusetts Forest Resources Plan", approximately \$12 million dollars worth of stumpage is harvested annually in Massachusetts, and the value added by manufacturing in the Massachusetts forest products industry exceeds \$1.1 billion annually. The forest products industry consists of more than 1,000 firms employing nearly 40,000 people which accounts for more than 6% of all employees in Massachusetts. Households in Massachusetts burn around one million cords annually which is the equivalent of roughly 150 million gallons of fuel oil.

Areas in Massachusetts supplying forest products will decrease in the future as more forested land is developed. Because of this, it is increasingly important for the Division's forested land to be well-managed on a sustained yield basis so as to produce forest products within a multiple-use system.

Forestry Impacts

While harvesting of forest products has an initial impact on the areas where these harvests occur, the results are ultimately beneficial. Plant succession is altered to grow tree species with a commercial value that are adapted to the site. A diversity of age classes is created to produce forest products on a more sustained basis.

The harvest of forest products has an impact not only on vegetation, but also on wildlife, water quality and quantity, forest recreation and aesthetics.

Wildlife

The most important characteristics for wildlife are interspersion, edge and diversity. Edge refers to the area where two plant communities convene creating a more vegetationally diverse area. Forest management should aim to maintain a significantly diverse "edge" (diverse by age classes as well as species) which is very attractive to wildlife.

Water Quality and Quantity

The major cause of impaired water quality associated with the harvest of forest products is soil erosion. The cutting of trees and other vegetation by itself has little effect on water quality, however, skidding and hauling of forest products can disturb the soil creating erosion particularly on sloping land. Most adverse effects are associated with poorly designed and maintained skid roads. Carefully planned and maintained skid trails and log roads cause minor erosion and water quality problems on a short-term basis. Buffer strips of vegetation, as required by the Massachusetts Forest Cutting Practices Act (Chapter 132), left adjacent to water bodies prevents, or at least greatly reduces, eroding soil from entering the water with the additional benefit of maintaining streamside shade, thus eliminating potential water temperature changes.

A harvest of forest products increases the quantity of water available and thus, the yield of the watershed, by reducing the evapo-transpiration (EVT) loss through trees and other vegetation. Over time, regrowth of vegetation increases the EVT.

Because of the Forest's proximity to the Nashua River, it is extremely important that erosion and sedimentation is controlled. Properly planned forest product harvests, following guidelines stipulated in the appropriate land stewardship zone and by the Forest Cutting Practices Act, will not exert serious negative impacts on water quality or quantity of the river.

Recreation

Forest management will have little effect on the passive recreational uses permitted in the Natural Resource Management Zone. However, recreational uses might have to be excluded temporarily from areas where forest management work is being conducted for safety reasons. Forest product harvests will be used (where feasible) to create access trails not only for forest management, but also for hikers, hunters, and other passive recreational use.

Aesthetics

Forest management has an impact on the aesthetics of a forest which can be either adverse or beneficial depending on the observer's perspective. Most adverse visual impacts associated with forest management are short-term in duration. Slash generates the most objection from observers. Slash cannot be economically or feasibly removed or chipped in place since such practices are too costly to justify the results, and the equipment necessary for treating slash would result in destruction of established regeneration. The most economical and efficient method of treating slash is to lop it in place, move it back from heavily used roads and trails, and educate the forest

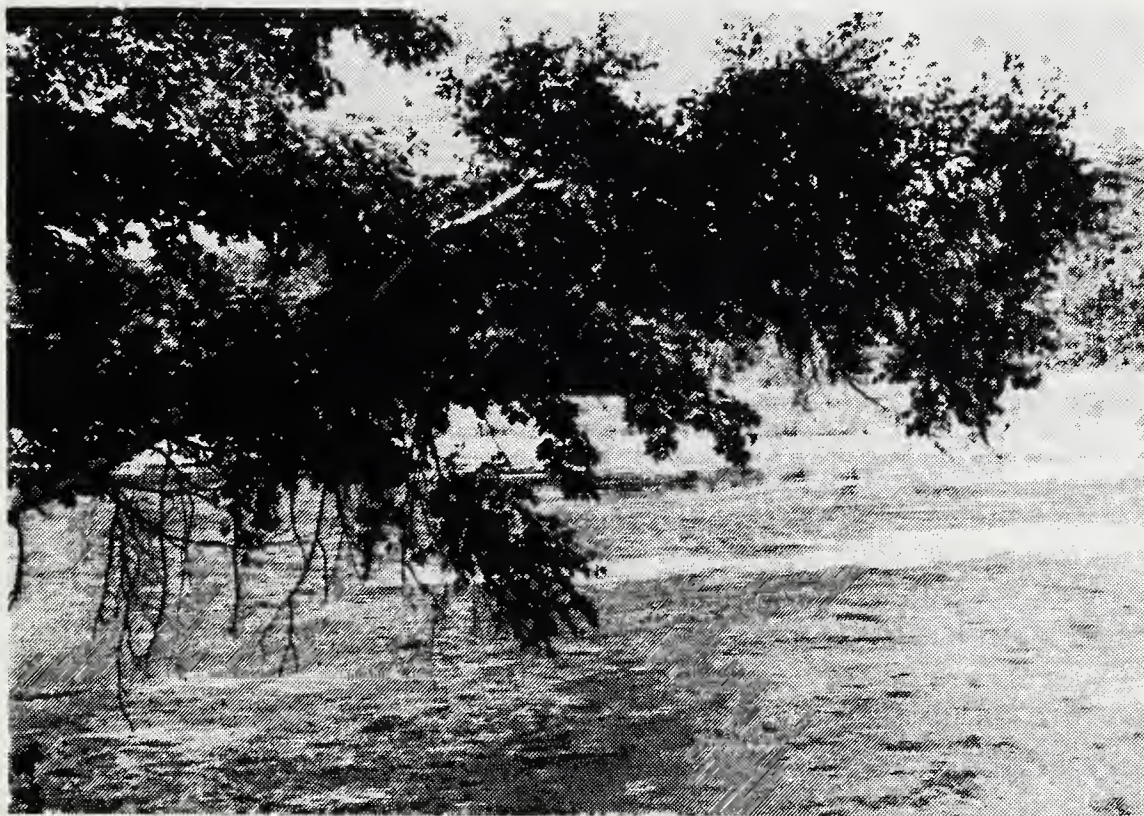
Aesthetics continues

users that slash treated in this manner has only a temporary, minimal adverse impact on aesthetics. Because slash decays rapidly, there are associated benefits to slash such as providing cover for wildlife, protecting emerging regeneration, and recycling of nutrients. Openings that are created in the Forest revegetate quickly, thus screening and covering the decaying slash as a new forest stand is established.

Vistas and scenic views can be opened up giving the Forest a cleaner, well-managed appearance and providing a visual variety which is often lacking in unmanaged forests.

Practices that minimize adverse visual impacts will be used where practical, particularly where people come in contact with the Forest, such as road and trail sides and the shoreline of the river. Silvicultural activities, when performed properly, can enhance the Forest aesthetically, particularly in the long term.

The multiple-use concept ensures a healthy productive forest that produces a perpetual supply of raw materials without curtailing a forest's unique service in providing wildlife habitat, soil and water protection, and forest recreation and enjoyment. Multiple use favorably enhances forest activities, competitively contributes products to the forest industry and wood-using consumers and uses a renewable resource for society's benefit.



Pepperell Pond

FORESTRY

PLANT SUCCESSION

The vegetative cover that exists today at the J. Harry Rich State Forest is the result of both natural and man-made disturbances along with climate, soil and topography that have interacted over time. This vegetative cover is continually changing its composition and structure. Plant succession, or replacement of one plant community over another, proceeds from pioneer plant communities which colonize bare rock or soil, through intermediate stages, and eventually to a climax forest of shade tolerant trees. Although a climax forest is able to reproduce itself and is more ecologically stable and resilient to natural disturbances than earlier successional stages, it, like all plant communities, is dynamic and constantly undergoing changes even though many of these changes are generally slow and often go unnoticed by man.

Both natural and man-caused disturbances disrupt and alter plant succession. Examples of natural disturbances that affect plant succession include storm damage (wind, snow, ice and lightning), severe gypsy moth defoliation and other insect and disease problems and forest fires. Some disturbances affect the health of vegetation, while other disturbances cause the ecosystem involved to regress to an earlier successional stage. After a forest fire, for example, pioneer plant species such as Poplar and Grey Birch may replace a woodland of predominantly Oak.

Besides the changes that have occurred as a result of natural disturbances, the vegetational character of J. Harry Rich State Forest primarily has been affected by man-made disturbances. These disturbances have been caused by various activities that were connected with how the land was used. As previously mentioned, the land within the bounds of the Forest was originally cleared for pasture land and cultivated for agricultural purposes by settlers in Colonial times. When the land was abandoned for agricultural uses in the 1800's, an even-aged forest took over the land; first in pioneer hardwoods (Grey and White Birch, Aspen and Cherry), and then a forest of predominantly White Pine became established in the partial shade of these short-lived hardwoods. When the pines became large enough, they were indiscriminately harvested. Forest fires which were commonly set by trains from adjacent railroad lines probably destroyed much of the accumulated organic material by burning down and exposing the sandy soil below. As a result, a plant community that was common to burnt-over soils which included Pitch Pine, Scrub Oak and Grey Birch took over these disturbed sites. Over a period of 60 years, silvicultural practices which involved the manipulation of forest vegetation and consequently alteration of plant succession has produced the stands of pure White Pine that exist throughout most of the Forest today.

Forestry continues

In order to retain these White Pine stands and to ensure that younger trees of this specie become established there must be proper management which also will alter natural plant succession. This alteration is necessary because the White Pine plant community, being an intermediate successional stage is not as stable as is a climax forest. The understory of the White Pine community in the J. Harry Rich State Forest is composed predominantly of hardwoods which, over time, mix with, overgrow and replace the less shade-tolerant White Pine. In order to ensure the continued dominance of White Pine, there must be careful and skillfull management particularly involving curbing the growth of these hardwoods.

The wet areas of the Forest are predominantly composed of Red Maple which is not a climax forest type. Left to natural succession, in time, the red maple trees will be replaced in most areas by a forest that is dominated by Hemlock and Yellow Birch which are both shade-tolerant species that are able to reproduce themselves in wet soils.

Silviculture practices can be used to manipulate the density and composition of the plant community in both the overstory and the understory to meet the timber, wildlife, water resource, recreation, and other aesthetic needs of the forest resource both today and in the future. An understanding of plant succession and community dynamics is important if multiple-use goals are to be provided. The information collected for the Forest Inventory and Stand Analysis for the J. Harry Rich State Forest, prepared by Leupold Forestry Service, is vital in the understanding of plant successional stages of the forest along with silviculture treatments recommended to meet these multiple use objectives.

FOREST REGULATION

Forest regulation involves regulation of the Forest by age and classes. Where practical, a forest regulation plan should attempt to create a balance of age classes over time. However, this is difficult and sometimes impossible with small areas of less than 1,000 contiguous acres of forest land such as the J. Harry Rich State Forest.

A regulated forest creates a balance of age classes that provides for a continuous yield of forest products, creates diversity beneficial to wildlife, and minimizes damage to the forest from natural disasters and occurrences, such as wind and ice storms and insect and disease epidemics, which generally adversely affect certain species within specific age classes.

At present, there is very little age variance over most of the acreage of forest land in the J. Harry Rich State Forest. The White Pine Stands are all around 60 years old, the Red Pine plantations are 40 to 50 years old; and the Red Maples are also 40 to 50 years old.

The simplest form of area control requires that a fraction of the area be regenerated annually. In the case of a one hundred year rotation, one percent of the sustained yield acreage (Natural Resource Zone minus non-stocked areas, wetlands, and sub-marginal sites) would be regenerated annually. Each age class represents ten years; and, it is more critical from a management point of view that each ten year age class represent approximately ten percent of the area. Therefore, it is more important that ten percent of the area be regenerated every ten years. This allows for fluctuations in the annual area regenerated every ten years. This allows for fluctuations in the annual area regenerated plus facilitating factors, such as market conditions, seed production, and regeneration conditions.

As mentioned, J. Harry Rich State Forest is too small by itself to be feasibly managed as a truly regulated forest and, therefore, must be considered with the stands in the other areas of the "Management Unit" -- namely the Townsend State Forest in Townsend and Willard Brook State Forest in Townsend and Ashby. In addition, the White Pine stands which make up the majority of the forested acreage are growing on sites that have a very high site index for White Pine, making for longer than normal rotation periods than are both silviculturally and economically feasible.

Even though the Forest by itself will never become fully regulated, some diversity of age classes should be created by regenerating some of the hardwood stands, oversocked Red Pine stands, and perhaps some of the lower quality White Pine stands. This would provide greater diversity for wildlife, particularly in the hardwood stands and the stands that would regenerate to hardwoods. Hardwood stands, being in short supply in the Forest, provide a better overall wildlife habitat than softwood stands.

FORESTRY

Forestry Regulation (continues)

In addition, protection from insects, disease and other natural disturbances can be enhanced by creating a diversity of age classes and species composition.

Other than the above forms of regeneration, regulation to create a sustained yield of forest products from this small acreage alone should not be initiated.

The Department will continue White Pine by thinning existing stands when the stocking is greater than the optimum density. The greatest challenge will be to regenerate White Pine, particularly on the wetter sites. This challenge can be looked at as an opportunity in which different methods of harvesting and site preparation can be used and experimented with to determine the most successful methods and timing with seed crops to establish successful White Pine regeneration.



White Pine Regeneration

FORESTRY

INVENTORY

An intensive forest inventory was conducted by Leupold Forestry Service of Lunenburg, Massachusetts during the fall of 1982 and spring of 1984.

The Forest was divided into three main compartments with each main compartment further divided into three sub-compartments creating smaller units in order to facilitate record keeping. (see Appendix 3, Forest Compartment map).

For this inventory, forest types were determined using Soil Conservation Service 1980 black and white aerial photographs with forest types checked by field investigations.

This inventory involved a 10 factor prism which was used to sample points every 227 feet along cruise lines with a standard deviation of +5%.

The inventory produced the following information:

Basal Area (total and by species)

Forest Type

Tree per acre by species

Mean diameter breast height by species

Percent crown of total tree height

Timber Volume

Present and projected growth rates

The completed inventory is in a separate document titled Forest Inventory and Stand Analysis for the J. Harry Rich State Forest, Groton, Massachusetts, prepared by the Leupold Forestry Service.

FORESTRY

TREE FARM STATUS AND POTENTIAL FOR A DEMONSTRATION FOREST

The forest land that is presently the J. Harry Rich State Forest became Massachusetts Tree Farm #15 in 1956 while under the ownership of J. Harry Rich. Today there are more than 1,200 certified tree farms in the Commonwealth.

The tree farm system is sponsored by the American Forest Council, which is dedicated to the management of forest resources to increase the supply of forest products while improving wildlife habitats, providing access for outdoor recreation and safeguarding watershed protection.

In 1981, the National Tree Farm Advisory group voted to allow the J. Harry Rich State Forest to maintain tree farm status under the Commonwealth's ownership as Massachusetts Tree Farm #15 thus creating a landmark decision which established J. Harry Rich State Forest as the first State-owned property in the country that is a certified tree farm.

In conformance with specific conditions and regulations associated with the designated tree farms status, the J. Harry Rich State Forest will be reinspected every five years to ensure that proper forest management is being applied.

Because it is a certified tree farm, the J. Harry Rich State Forest will be used as a model to both demonstrate and interpret multiple-use forest management to private woodland owners, as well as to the general public.

RECREATION

TRAILS SYSTEM AND USE

The trails system within the J. Harry Rich State Forest consists of 4½ miles of mostly unimproved woods roads that are passable by at least a four wheel drive vehicle. They are presently used for a multiple of recreational uses, both motorized and non-motorized. There are also 3,450 feet of overgrown woods roads that still are discernible but that need to be cleared out before they could be used as part of the transportation and trails system. There are 450 feet of hiking trails that are used primarily by fishermen along the banks of the Nashua River.

DEM now owns the abandoned B&M Railroad Right-of-Way directly which abuts the Forest directly for 1½ miles and is used as part of the trails system of the Forest.

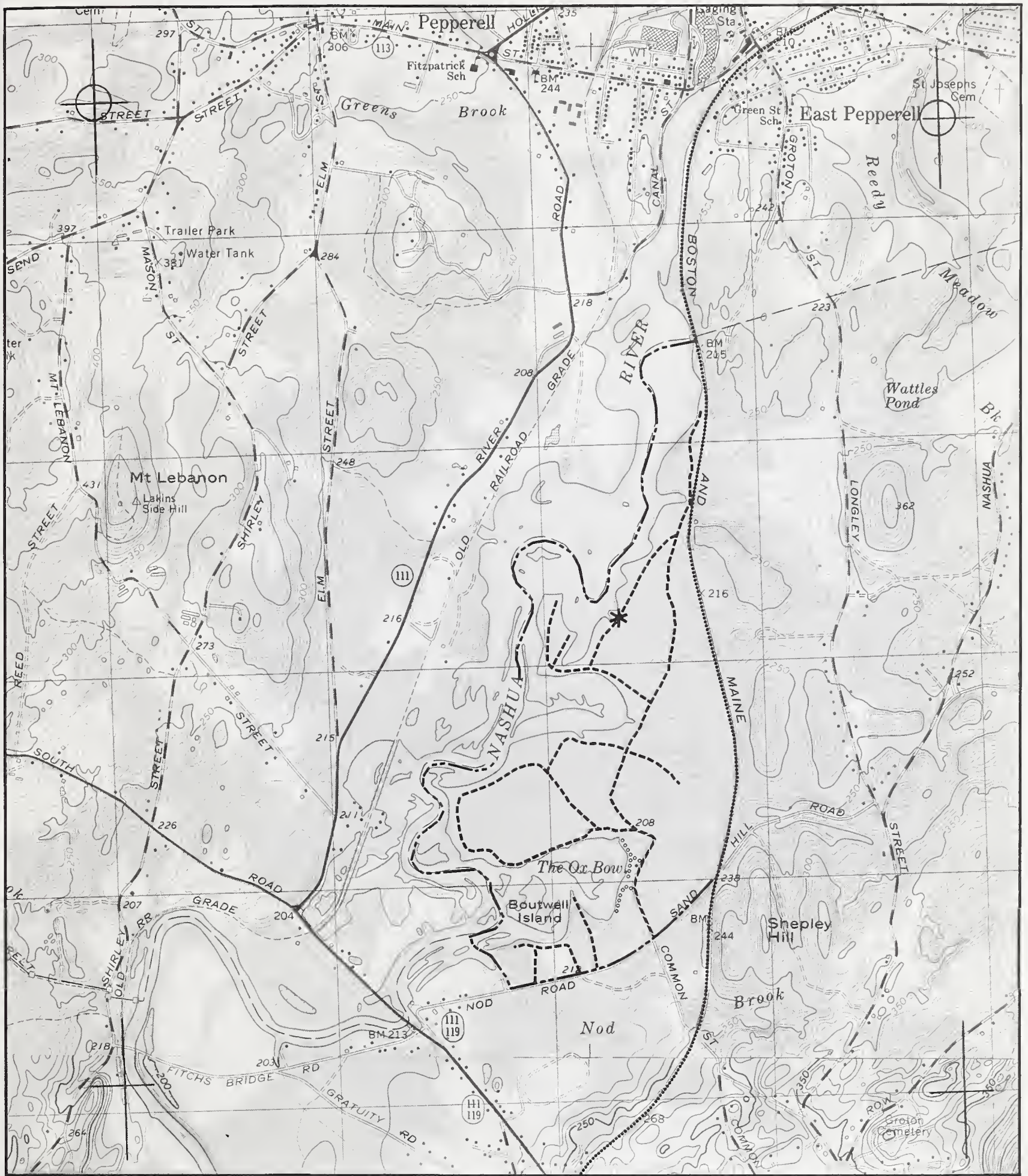
Of the total 27,750 feet of the transportation and trails system, 18,800 feet (3½ miles) is in fair to poor condition and in need of improvements particularly if it is to be used for vehicular access for forest protection and management. There are muddy and rutted areas due to a lack of proper drainage as well as areas where there are many exposed roots. (See Trails and Roads map)


NASHUA RIVER USES

The Nashua River abuts the J. Harry Rich State Forest for 3.8 miles along Pepperell Pond, an impoundment that was created by the dam in East Pepperell. The river offers multiple recreational uses.

Fishing, mostly for bass, duck hunting in the fall, and trapping for muskrat and beaver are all done along the river and its tributaries. Canoeing and boating are also popular uses of the river. The Groton School, a private school located upstream from the Forest, uses the river to practice racing sculling shells.

The above uses have expanded in recent years due to increased development and population growth in the surrounding towns. These increases have heightened the demand for water-based recreation, and, along with this, have created a focussed effort toward river conservation and cleanup, which has led to the dramatic improvement in water quality. The Nashua River Watershed Association's 20 year effort to bring about upgrading of sewage treatment plants along the river has led to dramatic improvements in water quality with the support of riverfront communities, state and federal governments.





**J. Harry Rich
State Forest**

Guidelines for
Operations
And
Land
Stewardship


PREPARED BY
THE MASSACHUSETTS DEPARTMENT
OF ENVIRONMENTAL MANAGEMENT

ACRES

1
10
25






0 500 1000 3000 FEET

NORTH



Trails and Roads

LEGEND

	Gravel Road
	Woods Road
	Railroad Right-of-way
	Path
	Overgrown

INTERPRETATION

No formal interpretive programs are currently offered at J. Harry Rich State Forest. There are no interpretive centers at the Forest at the present time.

Recommendations for interpretive stations and activities can be found in the "Recommendations" section of this plan.



An Informal Interpretive Tour

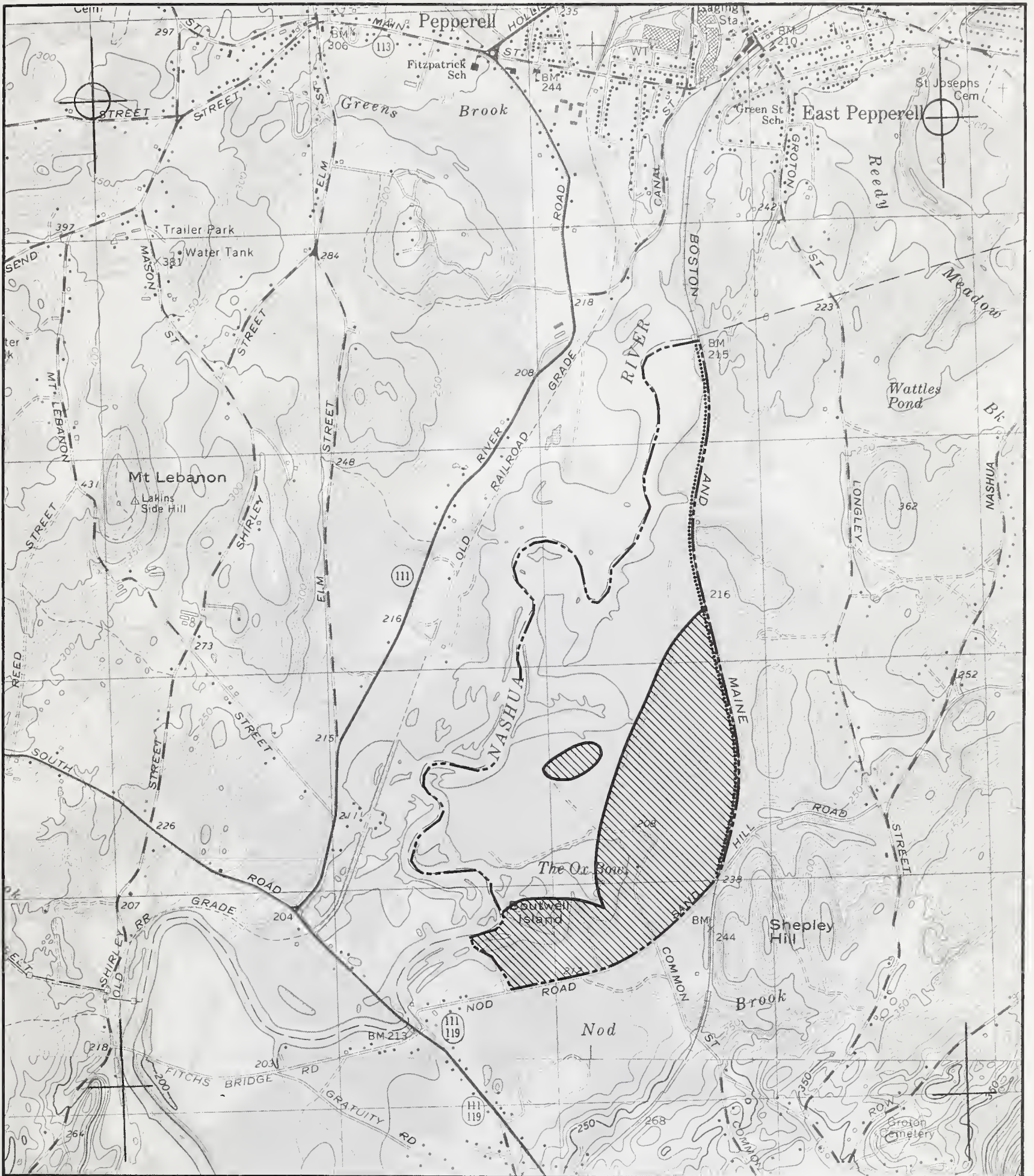
HISTORIC/CULTURAL FEATURES


J. Harry Rich State Forest has an abundance of cultural features as identified by the DEM Cultural Resources Baseline Inventory conducted during 1983 and 1984. The inventory provided general information on the cultural and historical resources of the forest and park system. In-depth studies into most of the resources at the Forest are needed to determine their significance and the degree of resource protection and management required. (See Cultural Features map)

On several occasions DEM staff made visits to the Forest to pinpoint the exact locations of the known cultural features. A few sites were located while others could not be found. More intensive research by professional archaeologists should be undertaken to locate these sites.

The following is a description of the known cultural sites within J. Harry Rich State Forest. The cultural map shows the general location of these sites.

- * Dating back to 1656, an area was the site of John Tinker's Trading Post. John Tinker owned and operated the outpost and lived in Lancaster, often using the Nashua River for transportation.
- * Location of Nutting Farm Plantation. Granite posts remain.
- * An old cart path that crossed the Forest to a spot in the river known as the Stoney-Wading-Place, or Stoney - Fordway. This path became the stagecoach road from Boston to Keene, New Hampshire.
- * Groton's first settlement was located in the Forest in the early 1600's. Numerous cellar holes are all that remain of these settlers' homes.
- * A succession of mills that took advantage of the Nashua River's steady flow were located just outside the forest boundary: 1794 -- corn and grist mill; 1828 -- grist mill; 1847 -- J. Whitcomb Mill, and from 1856 - 1920 -- Hollingsworth Mill.
- * Old B&M Railroad line from the industrial era, first in use around 1848-1982.
- * Charcoal pits between 50 - 80 feet in diameter are scattered throughout the Forest. Charcoal was produced here and may have been used to power locomotives on the nearby railroad line.



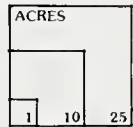


J. Harry Rich State Forest

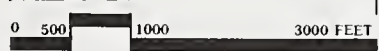
Guidelines for Operations And Land Stewardship


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OF ENVIRONMENTAL MANAGEMENT

ACRES



0 500 1000 3000 FEET







NORTH

Cultural Features

LEGEND

-  Historic Railway
-  Historic Sites

AESTHETIC FEATURES

Although J. Harry Rich State Forest was not considered to be a distinguished landscape according to the Massachusetts Landscape Inventory (DEM, 1983), it has several attractive qualities and features. Possibly, the most significant scenic feature of the Forest is the Pepperell Pond and Nashua River area which can be seen along several woods roads and paths. A peninsula located within the area offers a more expansive view of the river.

White pine stands along Forest trails provide a fine-textured, evergreen landscape for trail users for all seasons.

There are also open glades, swamps, plantations of Red and Scotch Pines and Norway Spruce interspersed with hardwoods with an understory spotted with berry bushes.

Several attractive wildflowers grow along the trails as well as along the banks of some Forest brooks.



One of Numerous Wildflowers

MANAGEMENT RESOURCES

PERSONNEL

At the present time, there are no personnel assigned to the J. Harry Rich State Forest. The overall supervision and maintenance of the area is the responsibility of the supervisor of the Willard Brook State Forest. There is a once or twice a week surveillance of the area, and more often if the need arises.

Recommendations for permanent and seasonal staffing can be found in the "Recommendations" section of this plan.

EQUIPMENT

As with personnel, there is no equipment specifically assigned to the area. Any equipment needed to do any type of work on the area is brought down from the Willard Brook State Forest. There are no buildings on the area to house any equipment that might be needed, therefore, whatever is needed is used on a day-to-day basis and returned to Willard Brook at the end of the day.

Recommendations for a full complement of needed equipment can be found in the "Recommendations" section of this plan.



Region 2 Forests and Parks Personnel

FOREST FIRE MANAGEMENT

The Bureau of Forest Fire Control within the DEM Division of Forest and Parks is responsible for assisting communities with fire control in the forests of the Commonwealth. There are fourteen district areas statewide within the Bureau that provide assistance in the form of backup equipment and highly trained forest fire fighting manpower.

J. Harry Rich Forest lies in District 6 which covers all of Northern Middlesex County.

Due to the sandy soil conditions in and along boundaries of the property, the area is prone to fast as well as deep burning fire in the low, humus filled sections.

Roads in the Forest are deeply furrowed and are inadequate for use by forest fire fighting equipment or for any other emergency vehicles.

EQUIPMENT

#64 and 1 Tank Truck (1500 gals) at Great Brook Farm State Park, No. Carlisle.

#65 at Willard Brook State Forest in Townsend.

INSECT PEST CONTROL

The Bureau of Insect Pest Control (IPC) has the responsibility of controlling insect pests and diseases of forests and shade trees, primarily on DEM lands. Bureau personnel, in conjunction with Forests and Park staff, remove hazardous trees and limbs. IPC also deals with insect pests such as gypsy moths, When warranted, they spray forest pest infestations. Although members of the IPC crew are licensed to apply pesticides, pesticides are used only when necessary.

Region 2 has an IPC crew supervised by two District Supervisors, each responsible for a county in the Region. The following is a summary of the insect pest control and related efforts by the IPC crew at J. Harry Rich:

GYPSY MOTH CONTROL

Currently, the Insect Pest Control Staff monitors the Forest for gypsy moth and other insect and defoliation problems in two ways.

*Ground Surveys - There is a gypsy moth trapping program in the general area surrounding the Forest when gypsy moths become evident.

*Aerial Survey - The staff conducts annual aerial surveys over the Forest looking for evidence of defoliation.

RED PINE ADELGID

The staff annually monitors the Forest for an insect that seems to be migrating northward called Red Pine Adelgid. This insect is a form of aphid that is deadly to Red Pine.

J. Harry Rich isn't currently being sprayed to control insects.

LAW ENFORCEMENT

The Forest is presently protected by the following types of law enforcement:

1. Environmental Law Enforcement Officer (Game Warden). The Division of Law Enforcement assigns officers to areas around the state to enforce the state's fish and game laws on private and public lands. This officer spends a certain percentage of his/her time in the state's forests and parks in his/her area enforcing the fish and game laws and the DEM's Division of Forests and Parks, rules and regulations (304 CMR) covering that particular park or forest.
2. The local Police Department also provides assistance in monitoring the behavior of people using the area. They have been very helpful in assisting D E M with any problems that have arisen.
3. State Police. The Massachusetts State Police should can be contacted if necessary.
4. Willard Brook State Forest park crew. Although park employees do not have police powers, they do have authority to request that Forest users comply with existing rules and regulations. However, the three aforementioned law enforcement agencies will ensure compliance, and will take legal action if necessary.

Chapter Four

Analysis

INTRODUCTION

In this chapter, the information presented in the Existing Conditions chapter is analyzed and the Forest is divided into management zones according to the environmental sensitivity of each particular resource. Zoning the property ensures that resource values are protected from incompatible uses. The management zones of the Department's Land Stewardship Zoning classification are (in decreasing order of sensitivity) the Unique Resource Zone, Environmental Protection Zone, Natural Resource Management Zone and Developed Lands Zone. By dividing the Forest into these four zones, it is possible to regulate activities within certain areas of the property so that vulnerable areas are protected from unnecessary damage and future development can be direct to those areas that can tolerate intensive uses.

Once zones are established by DEM, land areas in lower zones can be moved up to more restrictive zones if the land's resources are found to be sensitive or significant enough to require more protection. For example, land in the Natural Resource Management Zone that is found to contain a rare or endangered species can be easily rezoned up into the Unique Resource Zone. Downzoning land, for example, (Unique Resource Zone) to a less restrictive zone (Environmental Protection Zone) requires environmental review through the Massachusetts Environmental Policy Act (MEPA) which may be lengthy and difficult.

In order to determine the zoning scheme for the Forest, the GOALS team reviewed the existing conditions information that they gathered, both in text and map form. The categories of geomorphology, soils, hydrology, vegetation, wildlife, and cultural features were the most valuable in identifying the sensitive and significant resources of the Forest. The team then determined which areas of the Forest needed protection through the most restrictive zone, the Unique Resource Zone, and proceeded with the other zones in order of decreasing sensitivity.

LAND STEWARDSHIP ZONING

The following is the recommendation of the GOALS team as to how J. Harry Rich State Forest should be zoned. A synopsis of the purpose and management guidelines of each zone is listed along with a justification as to why areas of the Forest should be included in each zone. The recommended zoning scheme is shown graphically on the Land Stewardship Zoning Map and the complete zoning classifications are available for public review at the Willard Brook State Forest Headquarters and the Region 2 Headquarters in Carlisle.

UNIQUE RESOURCE ZONE

Natural Areas Subzone

Purpose: protect an area's unique natural resource for its scientific, ecological, and educational values. Natural areas will be managed in order to maintain or enhance significant resource features. Examples include: habitats for rare plant or animal species, exemplary natural communities, or unusual geologic features.

Management Guidelines:

Recreation

- no intensive recreational use, passive uses permitted - use by general public not encouraged
- nature interpretation, bird watching, and photography are some appropriate uses

Visual Resources

- maintain area in a natural state

Wildlife Management

- no habitat manipulation allowed unless specifically designed to promote rare species

Transportation

- no new roads will be constructed
- nature trails can be established
- existing roads or trails may be maintained

Silviculture

- no cutting of vegetation unless it favors rare species or natural community

Facilities

- no new construction

There is a climax swamp type area (5 acres) with Hemlock and Yellow Birch vegetation in the Forest that is regionally significant enough to justify its inclusion in the Unique Resource Zone, Natural Area Subzone (see the Land Stewardship Zoning Map for location). This swamp type is special and uncommon in Northeastern Massachusetts because few swamps in this region have been allowed to remain in this climax stage since many were at one time drained and/or cleared for agricultural purposes. The cleared wetland areas have reverted to Red Maple and will take many years of succession to reach the climax swamp type. Other than this area, no known unique natural resources have been identified at the Forest that warrant inclusion in this Subzone. If further study by DEM and the Massachusetts Natural Heritage Program identifies unique natural resources that require protection or management through this zone, the Department would upgrade the present zoning of those resources to the Natural Resources Subzone.

Cultural/Historical Subzone

Purpose: recognize and provide for the protection of an area's cultural, visual, or historic features. Examples include: archaeological sites, historic sites, historic landscape ruins, and homesteads.

Management Guidelines:

Recreation

- only passive recreation near site; recreation discouraged if it could adversely impact site
- intensive recreation allowed in vicinity of site when it will not adversely impact site
- main public uses revolve around interpretive activities

Visual Resources

- custodial management will be undertaken as necessary to maintain or enhance historic value of site

Wildlife Habitat

- no formal wildlife habitat management activities

Vegetation

- vegetation management allowed under historic landscape restoration plan

Transportation

- all roads and trails located to avoid impacting historic sites
- existing road or trails may be maintained as long as they do not threaten or degrade cultural/historic resource

Silviculture

- operations in the vicinity of the site will give consideration to maintaining site integrity

Facilities

- no new construction unless part of a formal protection or restoration plan

Considering the research done to date through the GOALS planning process and the DEM Cultural Resource Program, there are no known unique cultural/historic resources that have been identified at the Forest that are significant enough to warrant inclusion in this Subzone. If further study by the Cultural Resources Program or other groups identifies unique cultural/historic resources that are significant and require protection and management through this Subzone, the Department would upgrade the present zoning of those resources to the Cultural/Historic Subzone.

ENVIRONMENTAL PROTECTION ZONE

Purpose: offer protection to soil, water, and other natural resources which may suffer irreparable damage by inappropriate management or use. This zone is designed for land which is sensitive for a specific reason: steep slopes, erodable soils, wetlands, etc.

Management Guidelines:

Recreation

- dispersed and non-motorized recreational uses permitted
- intensive, development dependent recreation not permitted

Visual Resources

- retain area in natural state or preserve existing cultural scenery
- public utility and transportation corridors not permitted

Wildlife Habitat

- intensive habitat manipulation probably not permitted

Vegetation

- vegetation management allowed under habitat management plan

Transportation

- passage through zone allowed on existing stable roadbeds or trails
- new trail or road construction permitted if limited to stable areas

Silviculture

- no conventional timber sales allowed
- limited cutting of vegetation allowed for: scenic areas enhancement, road or trail maintenance, or outbreak of a major insect pest
- acreage excluded from allowable harvest calculations

Facilities

- no new buildings except for small scale passive facilities such as interpretive exhibits, handicapped ramps, wilderness campsites, picnic areas allowed by Director

Insects and Disease

- infestations controlled through environmentally sound programs

Fire

- presuppression work shall be carried out and in the event of an uncontrolled fire the Division shall respond with appropriate means

The GOALS team has identified several natural features that require protection through this zone due to the sensitivity of the resource or the uncommon and special nature of the Forest vegetation and habitat. All land, including islands, that is below the 200' contour along the Nashua River should be included in this zone to protect the River and shoreline ecosystem as well as its visual quality. Inclusion of this area within the Environmental Protection zone limits activities according to the management guidelines of this zone along the shoreline and on the islands. DEM supports the sentiments of the Nashua River Watershed Association in not recommending fuel run motorized boats on the river.

NATURAL RESOURCE MANAGEMENT ZONE

Purpose: designed for land which can appropriately keep sustained yields of forest and agricultural products, water resources, wildlife, and dispersed outdoor recreation.

Management Guidelines:

Recreation

- opportunities for extensive recreation will be provided, including: hiking, cross-country skiing, picnicking, hunting, fishing, swimming, horseback riding, camping (primitive, nature study, etc.).

Facilities

- small-scale facilities are permitted such as gravel parking areas, picnic areas, boardwalks, 2-4 hole comfort stations,

Facilities (cont.)

and look-out platforms.

- Visitor centers, bathhouses, maintenance facilities, playfields, recreational vehicle camping, and major developments are not appropriate in this zone.

Visual Resources

- slash will be lopped, no branch greater than 1" in diameter will be more than 4' above the ground
- the shape of regeneration areas will be designed to enhance the visual resource
- utility corridors are allowed
- opening of vistas and maintenance of open fields will be given priority

Wildlife Habitat

- endangered, threatened, and unique species will be considered in forestry compartment plans
- a high priority will be given to maintaining critical or unique habitats
- reasonable number of den trees and snags will be left
- diversity of cover will be provided through a reasonable balance of age classes
- 50% shade will be left over and adjacent to streams

Transportation

- skid roads and truck roads will be carefully laid out by the forester considering grades, drainage, and stream integrity. Upon completion of the operation, roads and landings will be revegetated unless the roads are to be used for recreational trails or subsequent timber operations.

Vegetation (Silviculture)

- Forest lands are divided into productivity classes (high yield and standard) with only high yield sites being managed intensively. Management systems (evenaged, unevenaged) will be used to secure adequate natural regeneration. Timber Stand Improvement (TSI) operations will be used to improve the quality and vigor of inoperable timber stands. Commercial harvest cuttings will use the standard timber sale contract and competitive bidding for sales.

Agricultural Land

- the Division will actively promote the agricultural uses of suitable lands under its control

Wetlands and Water

- the Division will adhere to regulations developed under the Massachusetts Wetlands Protection Act (Chapter 131, Section 40) and will not undertake activities having a possible adverse effect on wetlands.

Insects and Disease

- infestations will be controlled through environmentally sound programs

Fire

- presuppression work shall be carried out; in the event of an uncontrolled fire the Division shall respond by the appropriate means.

Most of the Forest has been included in this zone because the land can be appropriately managed for forest products, dispersed outdoor recreation, and wildlife while providing sound management of the Forest's water and wetland resources. Most of the Forest has been actively managed for the production of white pine in the past; the investigation of the GOALS team has determined that the management guidelines of this zone provide sufficient protection for the majority of the Forest.

There is a special vegetative area of the Forest that is included in this zone but should be managed in the near future as a natural area. This area is the site where White Pine trees have grown to a large diameter (see Vegetation section - Existing Conditions Chapter). Though these pines are roughly the same age as other pine stands in the Forest, optimum site conditions (soils, wetness) and good management have significantly enhanced pine growth as evidenced in the larger diameter of these trees. These large trees have wildlife habitat value as hawks and herons prefer large trees for nesting.

Because of its value as a wildlife habitat, the Department has decided as a part of its policy, to disallow traditional forest harvesting at this site unless salvage cuts are necessary to remove trees that are hazardous to Forest users along the trails in this area.

Since the area will not be disturbed, is accessible from one of the Forest's main trails and is on the River's edge, it could be an excellent place to plant wildflowers.

Another designated natural area in this zone is located alongside a brook which extends for a distance of approximately 500' from the main Forest trail to the Nashua River (see Zoning Map). This area presently includes a variety of soils and exposures that make it especially suitable for numerous species of wildflowers, ferns, and Lycopodiums.

This area is reserved for demonstration, propagation and taxonomic study of indigenous wildflowers and ferns.

DEVELOPED LANDS ZONE

Intensive Recreation Areas

Purpose: designate land areas capable of providing high quality outdoor recreation and accommodating large numbers of users at one time.

Management Guidelines:

Recreation

- all legitimate recreational activities recognized by the Division are permitted in appropriate places. Hunting will generally be excluded for safety reasons.

Facilities

- construction directly related to all forms of outdoor recreation will be allowed. No administrative facilities allowed.

Visual Resources

- slash and debris for silvicultural activities will be removed or chipped and spread around the area
- new facility design will be in visual harmony with the site
- utility corridors will be permitted

Wildlife Habitat

- snags and den trees will be retained
- emphasis will be on maintaining vegetation having non-game wildlife values
- small-scale wildlife habitat improvements may be conducted
- landscape plantings will consist of native materials

Vegetation

- vegetation management will be encouraged to clear out non-native species, open up views, improve pedestrian access, and improve quality of existing vegetation

Transportation

- all main roads and bridges will be constructed or maintained to support a 75,000 pound load
- use of road by logging trucks may be restricted during the recreation season

Silviculture

- both evenaged and unevenaged management systems will be used
- acreage in this subzone will be excluded from allowable harvest calculations
- no minimum stand size applies in this subzone
- treatments will be conducted to deal with insect/disease with consideration of potential impact on recreation, and nongame wildlife habitat treatment will also be interpreted to the public.

Insects/Disease

- controlled through environmentally sound programs

Fire

- presuppression work carried out and fires controlled to minimize loss to the resource

The abandoned Railroad Right-of-Way from Ayer to the New Hampshire line that the Department recently acquired will be zoned as an Intensive Recreation Area. The width of the former railroad bed can continue to support intensive use as a long distance trail with a portion of the Right-of-Way to be paved for bicycle use.

Administration Areas

Purpose: designate and provide land areas and facilities for the efficient administration of forests and parks. This is the area for administration and maintenance buildings and facilities.

Management Guidelines:

Recreation

- no recreational uses provided for in this area

Facilities

- administration buildings, maintenance areas, storage facilities, parking lots, and operational structures will be located in this area
- location and design of all facilities should be compatible with existing landscapes and facilities

Visual Resource

- buildings designed to blend in with surrounding landscape

Wildlife Habitat

- trees and shrubs maintained when their presence does not interfere with efficient administration

Vegetation

- vegetation management encouraged to screen utility buildings from view, open up scenic views, improve pedestrian access, and to improve the quality of existing native vegetation

Transportation

- main roads and bridges will support 75,000 pounds

Silviculture

- no conventional timber sales conducted
- acreage excluded from allowable harvest
- no minimum stand size applies to this area

Insects/Disease

- infestation controlled by environmentally sound programs

Fire

- presuppression work shall be carried out and fires controlled to minimize adverse impact to the resource

At this time, there are no sites at the Forest that can be definitely zoned under Administration Areas since the exact location of administration facilities has not yet been determined. An area near Nod Road that has been identified as having potential for administration and recreation facilities will be discussed in the context of Reserved Areas.

Reserved Areas

Purpose: designate land suitable for future Intensive Recreation Area or Administration Area

Management Guidelines:

Recreation

- opportunities for extensive recreation activities may be provided

Facilities

- if new administrative or recreational facilities are required in the future, they may be located in the area

Visual Resources

- utility corridors permitted

Wildlife Habitat

- until area is developed for recreation or administration, it will be managed in accordance with wildlife guidelines under Natural Resource Management.

Vegetation

- vegetation management will be encouraged for aesthetic reasons to clear out non-native species, open up views, improve pedestrian access, and improve quantity of native species
- silvicultural operations will be carried out to enhance the anticipated future use of the area
- no minimum stand size; acreage will be excluded from allowable calculations

Transportation

- when possible, access will be provided using existing routes

Wetlands

- wetlands will not be used for intensive development

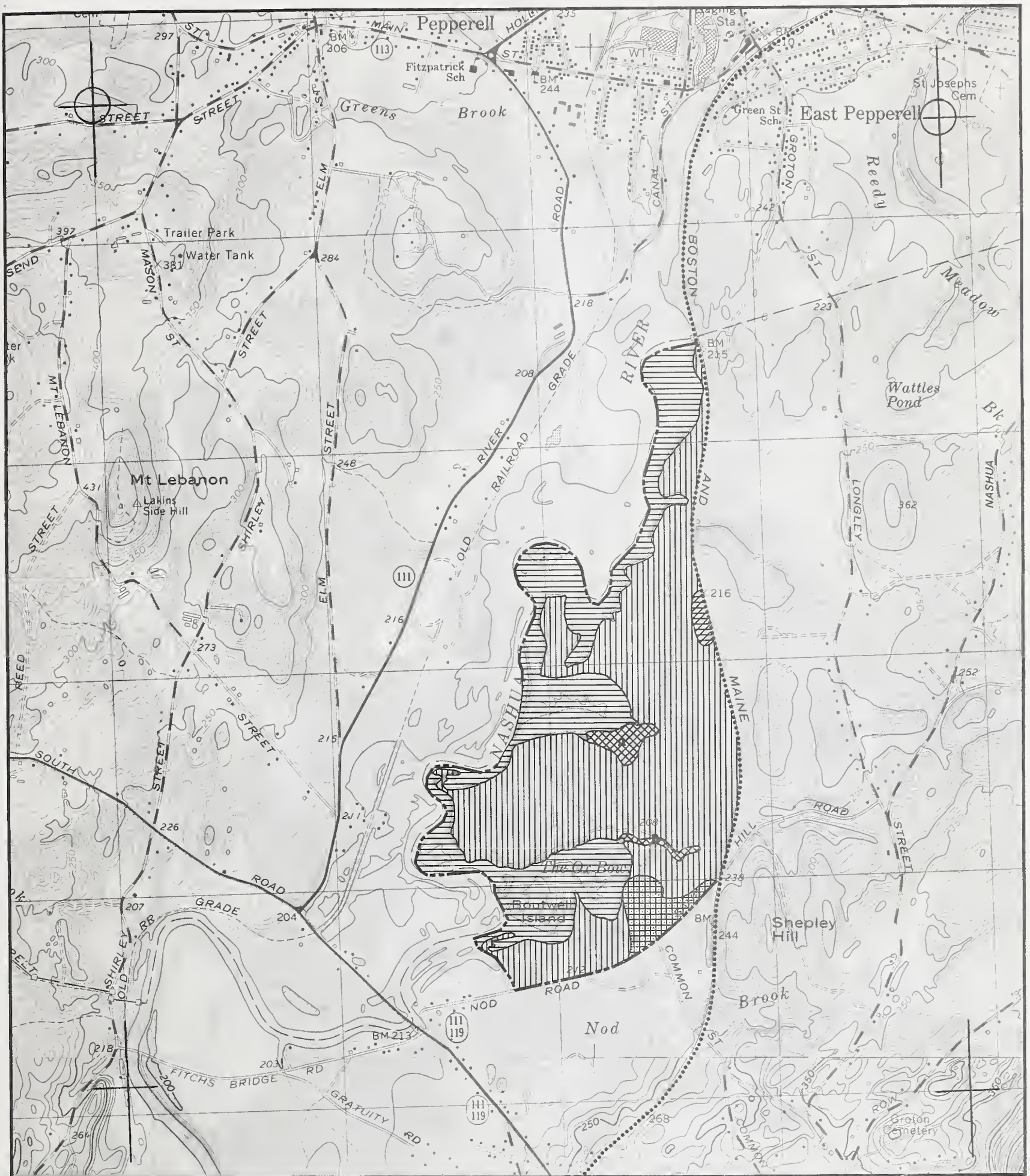
Insects/Disease

- Infestations will be controlled through environmentally sound programs

Fire

- presuppression work shall be carried out in this area and fires controlled to minimize loss to the resource

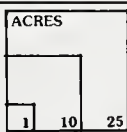
A small area near the intersection of Nod Road and the abandoned Railroad Right-of-Way has been included in the Reserved Area of the Developed Lands Zone. After investigation of the soils, topography, hydrology, and other natural and cultural resources, it was determined that this area can appropriately support both administration and intensive recreational uses; development of this site for a visitors center and a Forest headquarters will be recommended. Since further study is required to determine the exact location of these facilities, this section of the Forest will be included in Reserved Areas until these studies have been completed. Based upon study results, this section will then be re-zoned into the Intensive Recreation Area and Administration Area.



J. Harry Rich State Forest

PREPARED BY
THE MASSACHUSETTS DEPARTMENT
OF ENVIRONMENTAL MANAGEMENT

Guidelines for
Operations
And
Land
Stewardship



ACRES
1 10 25



LEGEND

- Unique Resource Zone
Natural Areas Subzone
- Environmental Protection Zone
- Natural Resource Management Zone
- Natural Resource Management Zone
Natural Area Zone A - Large White Pines
Natural Area Zone B - Wildflower Protection Area



Developed Lands Zone
Reserved Area



Developed Lands Zone
Intensive Recreation Area

Zoning

Chapter Five

Recommendations

RECREATION

TRAIL USE AND IMPROVEMENT

Because J. Harry Rich State Forest is a relatively new forest, trail uses have not yet been designated. We recommend that all Forest trails be designated for non-motorized uses. In order to provide adequate trails for these uses, the trails system must be improved so as to accommodate year-round use by two-wheel drive maintenance vehicles. Since the soils are richly organic and the water table is high during certain seasons, there are often numerous poorly drained areas throughout the trails and ruts are easily created. The most pressing need, therefore, is to improve the drainage along trails by installing culverts, side ditching and lining the trails with gravel. Since there is no gravel on-site, all materials will have to be trucked into the Forest. We recommend that use of geo-textile material to "stretch" the amount of gravel to be used.

In addition to improving the construction of the trails, we recommend that trails should be both well-marked (as described in the department's sign standards) and designed. We also recommend that loop trails should replace dead-end trails where feasible in order to promote improved "traffic" flow throughout the Forest.

Permanent and temporary interpretive stations that require minimum maintenance should be established throughout the Forest for the purpose of providing the public with trail maps and information regarding unique points of interests, along the trails as well as information about tree farming.

The accompanying table of specific trail recommendations should be implemented to improve and maintain the trails system for users and maintenance/management accessibility for the Forest staff.

In addition to making recommendations which are compatible with its own priorities, DEM should follow the recommendations/priorities suggested by the President's Commission on Americans Outdoors.

TABLE 3

Specific Trail Recommendations

<u>Trail Name</u>	<u>Trail Number</u>	<u>Trail Length</u>	<u>Trail Type</u>	<u>Veh. Access</u>	<u>Scenic Vistas</u>	<u>Recomm. Uses</u>	<u>General Recommendations</u>
ramp	1A	613	woods	2-all	613	Non-motor	Gravel mud
	1B	421	woods	2-all	0-421	Non-motor	
	1C	1064	woods	2-all	0-500	Non-motor	Gravel mud
	1D	300	woods	2-all	none	close	close, party
	2	1040	woods	2-all	740-1040	Non-motor	Gravel, mud and roots
	3	1224	gravel	2-all	1224	main access	Gravel mud correct drain Gravel
Parking	3	1030					
	3A	210	woods	2-all			
		400	path	foot	210-600+	access to river	Make loop tr
	4	5940	entire woods	4-wet	none	Non-motor	Entire main trail should be upgraded
	5	6680	woods	4-wet	500-5000	Non-motor	Gravel mud
	6	1625	woods	4-wet	750-1200	Non-motor	Need 12" and culverts and gravel muddy areas
	6A	765	woods	2-all to 500' only	none	silviculture demo area	Cut back over-growth (500' section)
Hickory Pt.	7	2400	woods	2-all (0-1090) 4-all (1090-2400)	140-2400	Non-motor	Upgrade 1090' Extend 500' tip of penins for scenic vi
	7A	730	woods	2-all	730	Non-motor	Loop trail to otherwise let revegetate
	8	2400	woods/ middle over-grown	2-all	290-2400	Non-motor	Reopen over section, (425-1900) install culvert and gravel a needed
	9	7925	RR grade	2-all	0-1000	Non-motor Wheeled	
	10	450	path	none	0- 450	foot	Fishing, hiking etc.
	11	1500+	woods	none	1000-1500+	Non-motor	Reopen and upgrade; roll terrain; high overlooks. Differs from of the Forest

RAILROAD RIGHT-OF-WAY

DEM has acquired the abandoned Railroad Right-of-Way (ROW) because it will be an excellent recreational trail resource. We recommend that the ROW be used as recreational Rails Trail and be designated for nonmotorized wheeled vehicles so as to maintain safe conditions for trail users. Allowed uses on the ROW would include:

- * hiking
- * horseback riding
- * nordic skiing
- * bicycling
- * jogging
- * snowmobiling (possibly on sections of the ROW where there are no nearby residences.

We recommend that the ROW be designed in such a way that will provide a maximum amount of multiple uses. Specific suggestions include:

- The surface of the ROW should be divided into a hard surface (asphalt) and a soft surface to provide a two-trail system. Vegetation could be used to separate these trails.
- A 10 foot or 12 foot culvert should be constructed in areas where two railroad bridges will be removed in order to allow continuous access for R.O.W. users.

DEM will work with public officials from the communities of Ayer, Groton, Pepperell, and Dunstable which are adjacent to the ROW with regard to providing parking, access, and public transportation to and enforcement for the trail.

- * Any town easement requests should be made to the Supervisor of Region II Division of Forests and Parks, Department of Environmental Management who is based in Carlisle.
- * DEM will honor all valid crossings. Requests for new crossings will be subject to review. Except for "at grade" crossings, DEM will restrict rights of use at potential "non. at. grade" as crossings.
- * Maintaining integrity of the trail is DEM's number one priority.

NASHUA RIVER

River Access/Canoe Launch

At present, access to the Nashua River is provided at the Groton town launch.

A canoe launch area needs to be established for camping activity. The current recommendations are:

- Coordinate with the Department of Fisheries and Wildlife to secure a site on Route 2A in Shirley on Massachusetts DPW land across from the Ayer Game Farm.
- Try to locate a canoe take-out in the East Pepperell dam area and negotiate parking in the redesigned East Pepperell Center.

Canoe Regulations

- Develop canoeing regulations

Primitive Canoe Camp

- A primitive camping area is recommended for the peninsula area (the Ox Bow) in the Forest which would be:
 - *accessible by water only (canoe)
 - *available from April to October
 - *serviced by portable toilets
 - *established for 12 sites with fireplaces
 - *allowed by permit only

INTERPRETATION

The J. Harry Rich State Forest should serve as a demonstration forest offering forestry interpretation. DEM wants to demonstrate that it is possible to harvest timber, grow wildflowers, provide recreational uses, and enjoy aesthetically pleasing scenery all at one facility.

An interpretive program would provide an excellent opportunity for DEM to inform and educate a large segment of the public with regard to the significance and interrelationship of the Forest's resources. More specifically, J. Harry Rich State Forest should serve as a demonstration forest which offers interpretation of various forestry techniques, offers information on the River, Rails Trail, wildlife and wildflowers.

DEM would like the opportunity to demonstrate that it is possible to harvest timber while providing other multiple public uses, including recreation, aesthetics, wildflower cultivation as well as providing an attractive wildlife habitat.

In addition to forestry interpretation, the numerous historic sites within the Forest could be interpreted to the public as well.

Further study is needed to determine what types of audience may be interested in learning about Forest resources and what types of programs would be suitable to inform the public.

Significant aspects of the Forest, for example, could be exhibited to school children. Another possibility would be for DEM to allow the Forest to be used as a Forestry Camp.

FOREST MANAGEMENT

SILVICULTURE

The Forest Inventory and Stand Analysis conducted by Leupold Forestry Service in 1983-1984 was an excellent job of quantifying the present conditions of the Forest stands at of the J. Harry Rich State Forest. The data described below and recommendations proposed are based on data from this inventory.

The White Pine/hardwood stands cover 348 acres of the Forest and all are generally in the 60-year old age class, with stocking levels ranging from understocked (below C level) to minimum stocking for full site utilization (B level). These present conditions indicate that silviculture treatment in the next ten years is not critical to the growth rate and condition of the overstory stands as they are not at high risk, overstocked or within ten years of maturity.

In the stands at or near full site utilization (B level) are some poor quality trees, mature trees, and small sawlog suppressed trees that can be removed commercially in the next decade. Care will have to be taken to ensure minimum damage to the residual stand and harvests should be conducted when White Pine seed is present, preferably during snowless months to increase soil scarification during skidding to increase White Pine regeneration.

In the stands that are understocked and which will not become adequately stocked within ten years (below C level), steps should be taken to ensure adequate regeneration of White Pine and release of White Pine regeneration where established but overtopped by hardwood regeneration. Practices to achieve this are pre-commercial and would entail some expenditures that would be costly initially, but should be cost effective over the long-term rotation of the stand. Different practices as outlined in the next section should be conducted for demonstration and experimentation. Detailed records of these practices should be kept to show the effectiveness and economics with respect to each practice.

The seven acres of Red Pine plantation are mostly fully stocked to overstocked and should be thinned to B level favoring the best quality trees as crop trees. Thinning also should be performed in order to establish an understory of White Pine regeneration by means of timing of thinnings during snowless months and good White Pine seed years.

FOREST MANAGEMENT

DEMONSTRATION FOREST

The J. Harry Rich State Forest has excellent potential to serve as a demonstration forest for the management and regeneration of Eastern White Pine. The Forest stands have been managed for more than sixty years, creating a high quality forest with White Pine being the predominant species. This situation creates an opportunity to continue this management and to demonstrate and experiment with different silvicultural practices to show forest landowners and the general public the methods, costs and benefits involved with each practice. The following include both recommendations of practices as well as areas to implement these practices in order to set up the Forest as an interpretive, demonstration forest.

Pruning Plot

In 1953, Professor J. Harry Rich set up five one-half acre plots to demonstrate the costs and benefits of pruning White Pine. Three of the plots were pruned and two were left unpruned as controls. These plots were pre-commercially thinned in 1953 and 1959 in 1973, they were commercially thinned as part of a timber sale with the logs from the pruned plots tallied and graded separately from the rest of the logs in the sale. Since 1973, little has been done on these plots. These plots should be located and all trees measured and marked to serve as a demonstration to the benefits of pruning along with timely thinnings. These plots are located in subcompartment 1C, Stand 17. (see Compartment Map, Appendix 3)

Regeneration Harvest

Although the White Pine stands are immature, there are areas where White Pine regeneration is present. These areas can be used as demonstration areas for regeneration harvests. Sub-compartment 2B, Stands 5 and 6, have an understory of White Pine established over much of the area and the site is drier and soil better suited for White Pine regeneration than most other areas of the Forest. This would be an ideal area to demonstrate a two-cut shelter-wood harvest on about ten acres. The first cut should be conducted during an abundant White Pine seed year in the snowless months; and; the second cut should be performed after abundant White Pine seedlings are fully developed (probably 8 to 10 years after the first harvest).

Regeneration Harvest Continues

If the first harvest fails to produce an adequate supply of White Pine regeneration, a three-cut shelterwood may need to be employed. Flexibility needs to be incorporated in these plots due to the experimental nature of these methods as well as environmental factors that are involved. It is imperative to keep detailed records of all silvicultural practices and results as well as economic aspects such as costs and revenues.

The shelterwood system of regenerating White Pine is the most proven and successful method. However, there are other methods which can be used, including clear-cutting, strip-cutting and seed-tree cutting. These methods may have an experimentation role in a demonstration forest and could be set up in different areas of the same stand as proposed for the shelterwood demonstration area. However, a lower priority should be put on implementation of these methods than on the shelterwood methods.

Intermediate Cuttings

As the forest stands of J. Harry Rich State Forest are generally in the middle of their rotation and not near maturity, they provide an ideal opportunity for demonstration areas of intermediate cuttings. Individual selection and group selection cuttings should both be used. Areas should be at least five to 10 acres in size and along the main road in order to be accessible to Forest users. The individual selection method should be used on one side of the road and a group selection on the opposite side. Below, three alternative areas are listed for these demonstration plots.

Sub-compartments 1C and 2C, Stands 9 and 17,
Sub-compartments 2A and 2B, Stands 2 and 5, and
Sub-compartments 3B and 3C, Stands 11 and 12. The best time to start White Pine regeneration is after thinning operations since, after removing hardwood, the less shade tolerant White Pine has a better chance to become established. Therefore, thinnings should be timed during abundant White Pine seed years whenever possible.

Establishment of White Pine Regeneration in Understocked Areas

All of Compartment 3, with the exception of the Southern part of Sub-compartment 3B, was harvested in 1978, leaving the stand in most areas understocked (level or below).

Some of this harvested area has adequately regenerated to White Pine, but in most areas White Pine regeneration is overtopped and suppressed by hardwood regeneration. Other areas are poor hardwood sites (brambles are in the understory) but are good white pine sites.

Several different techniques should be used to establish and/or release White Pine regeneration throughout this whole area which can be demonstrated to the public. One method is called mechanical release which involves cutting hardwood vegetation regenerating and overtopping around the White Pine with a brush saw. Sub-compartment 3C had a mechanical release of White Pine regeneration performed in the spring of 1986. This area is ideal to demonstrate this practice and should be monitored to determine if another release is necessary in two or three years due to hardwood stump sprouting that should start to occur in the spring 1987.

Another technique used to release White Pine regeneration is herbicide spraying. In areas of Sub-compartments 3B and 3C where White Pine regeneration is overtopped by hardwood regeneration, herbicides should be used to retard hardwood growth and enhance White Pine growth. The herbicide that will be used must be approved for use on broad leaf species and applied, as directed, by mist blowing directly on target species. Different herbicides with low wildlife toxicity can be used for the purpose of testing their effectiveness and cost per acre. Herbicides that also prevent stump sproutings have the advantage of being less labor intensive than mechanical treatment and should only have to be applied once. Both demonstration areas should provide a good comparison between mechanical release and release by use of herbicide.

In the areas of Sub-compartments 3B and 3C, where adequate White Pine regeneration is lacking, site preparation will

Establishment of White Pine Regeneration in Understocked Areas continues

be needed before White Pine regeneration can be established. Site preparation will require removing the hardwood regeneration and scarifying the soil to the mineral level. This can be accomplished by using a bulldozer with a root rake blade or a large harrow dragged behind it. This area should be planted with white pine seedlings, except for a small area which is approximately an acre or two, in order to observe the effectiveness of natural seeding. Planted areas will have to be released when hardwood competition becomes a problem. This method is quite expensive and has been used very little in Massachusetts.

As a demonstration Forest, J. Harry Rich State Forest would be an excellent place to implement these practices to determine both the silvicultural and cost effectiveness of each. A source of funding for these practices should be sought.

FOREST REGULATION

Other than creating a diversity of age classes and species composition in certain areas, regulation to create a sustained yield of forest products from this small amount of acreage alone should not be initiated. However, the Forest will be considered with regard to forestry regulation in conjunction with other state-owned forests in Region II.

SILVICULTURE AS IT RELATES TO WILDLIFE

Although there are areas in Sub-compartment 1C where Poplar are present, they have grown past the stage where they are of much benefit to wildlife. Poplar, in the seedling and small sapling state and particularly as sprouts, are delicacies and provide an ideal habitat for a variety of native wildlife, including ruffed grouse, white tail deer and cottontail rabbit. Because this type of early successional habitat is dwindling in this area as a whole small patches should be cleared in these areas in order to both encourage Poplar sprouting and create age class diversity.

We recommend demonstration and interpretation of such practices to the public with a description of how we can enhance habitats to attract wildlife within a multiple-use plan.

LAND ACQUISITION

The Department should have the following acquisition priorities regarding J. Harry Rich State Forest and the former Railroad Right-of-Way

RAILROAD RIGHT-OF-WAY

- * As land that abuts the former Railroad Right-of-Way becomes available, DEM should review acquisition possibilities to see if these lands might enhance the uses of the Right-of-Way.

OTHER AREAS RELATED TO J. HARRY RICH STATE FOREST

- * Work to protect the visual quality of Nod Road by establishing a vegetative buffer strip along the road which serves as the the main access to the Forest entrance. DEM should work with the Town of Groton and landowners to obtain conservation restrictions or other rights to land use that will afford protection of the visual quality of this road.
- * Pursue acquisition of land across the Nashua River from the Forest between the Nashua River and River Road from the Rt. 119 intersection to Canal Street.



Railroad Overpass

CULTURAL FEATURES

There are many potentially significant cultural features at the Forest which have been identified through the DEM Cultural Resource Baseline Inventory. Although they have been identified, the significance of each feature is unknown. Also, additional sites may exist in the forest which were not identified in the DEM Baseline Inventory. Therefore, the Department should take the following steps:

- * Conduct a reconnaissance survey of the Forest's cultural resources. This survey would locate the features, research their history and make an initial determination of their potential significance.
- * Protect the identified cultural features/sites that are potentially significant. The Forest and Regional Staff should consider the sites in the Baseline Inventory within all aspects of their management activities and provide for the protection of these in association with the DEM Cultural Resources Program.
- * Conduct the archaeological reconnaissance survey and evaluation of cultural resources prior to development of any Forest facilities.
- * Incorporate cultural resources into the interpretive programs that will be offered at the Forest, based on the results of the reconnaissance survey and in association with the Cultural Program.



An Old Well Hole

WATER RESOURCES

Because of its location adjacent to the Nashua River, water protection is one of the critical considerations in the development and management of the J. Harry Rich State Forest. Recommendations include:

- * Implementation of the Acquisition Recommendation to acquire and maintain at least a 300 foot deep green strip across the river from the Forest.
- * Coordinate with DEQE to test and monitor the streams and brooks within the Forest.
- * Support recommendations in the Nashua River Greenway Plan which were prepared by the Nashua River Watershed Association through a grant from the Massachusetts Scenic Rivers Program within DEM.

MANAGEMENT RESOURCES

PERSONNEL

Maintenance/Operations/Management (year-round)

- 1 - Senior Supervisor
Under the direction of the Regional Supervisor, directs the use and programming anticipated for the Forest and the bike trail, including: river camping, maintenance and management of trails and the Right-of-Way, demonstration forest, and the silvicultural management program in coordination with the Regional Management Forester.
- 1 - Assistant Forester
- 1 - Conservation Skilled Helper
- 1 - Conservation Helper

Maintenance/Operations/Management (seasonal)

- 2 - Conservation Helpers (April-October)

General Duties would include:
 - * Maintenance/Operations/Management of J. Harry Rich State Forest
 - * Maintenance/Operations/Management of R O W and patrol
 - * Forestry work
 - * Management of the primitive campground

Forest Information Center (year-round)

- 1 - Visitor Services Supervisor
(supervises all interpretive activities)

Forest Information Center (seasonal)

- 2 - Visitor Services Assistants (April-October)

General Duties include:

- * Guided walks
- * Maintain self-guided trails
- * Other programs/exhibits; programs to involve river, trail and forest resources
- * Coordinate workshops
- * Staff the Information Center

EQUIPMENT

Trail

- * Four-wheel drive tractor (70 hp range) with front end loader and other attachments (hydroclipper, rotary mower, sweeper, york rake, grader blade, Farmie winch, soil scarification tool)
- * Cushman vehicle for patrol and light maintenance
- * Snowmobile with tracking equipment for nordic skiing

Forest

- * 1/2 ton pick-up truck for patrols, maintenance, etc.
- * 1 ton steel body dump-truck (all wheel drive) with plow
- * 12 foot aluminum boat with 10 hp outboard motor and trailer
- * variety of hand tools and specialized forestry equipment
- * radios - both for the Forest and the trail (a base station and three portables)

FIRE CONTROL

The following actions are recommended in the area of fire control:

- * Continue the current staffing of the Groton fire tower during periods of fire danger.
- * Gravel the Forest roads to provide good access for fire equipment along with other emergency equipment and brush back roadsides so they are more effective fire breaks.
- * Assign frequent patrols within the Forest during periods of fire danger for fire protection and to discourage vandalism.
- * Establish and maintain fire holes at strategic sites throughout the Forest.
- * Maintain the good working relationship with the local town fire departments.
- * Post fire prevention signs at appropriate areas.
- * Acquire the following equipment for the district fire crew:
 - * Flotation pump
 - * Ten pump cans
 - * 200-gallon slip-on tank for use on a pickup during periods of fire danger in the Forest and in other nearby State lands
 - * Boat, motor and trailer equipped for fire suppression
 - * 20-man fire kit (approved by U.S. Forest Service)

INSECT PEST CONTROL

Conduct annual tree surveys and schedule IPC crew to remove dangerous/hazardous trees and limbs from areas with heavy public use.

Protect the Forest from major damage by conducting periodic checks to identify existing or potential threats from insects or disease.

Continue other current responsibilities of IPC crew:

- * Gypsy moth and other insect pest control through surveys and use of biological controls
- * Poison ivy control and weed control.

LAW ENFORCEMENT

We recommend that DEM's Division of Forests and Parks continue to work with the Division of Law Enforcement to enforce DEM rules and regulations (304 CMR).

We also recommend that the State Police Mounted unit, located in Concord, be contacted and asked to routinely patrol and Rails Trail the Forest on horseback.

The DEM Mounted Unit could be seasonally assigned to patrol the Forest and Rails Trail.

DEM may ask police departments from the Towns of Ayer, Groton, Dunstable and Pepperell for assistance along the Rails Trail.

FUTURE DEVELOPMENT

Before any development is planned and constructed, three issues must be addressed:

Water Rights

Rights to flow over parcels 1,2 and possibly 3 (located in the Forest) which are owned by the James River Paper Company (located downstream) should be considered.

Cultural-Historic Areas

DEM should perform appropriate investigations to discover the location of significant Cultural/Historic resource areas (especially the site of Groton's First Settlement) before beginning development projects.

Annual Visitor Numbers

DEM must first determine how many visitors come to the Forest before developing plans for facilities to accommodate its visitors.

FACILITIES

A Forest Information Center serving both the Forest and the ROW may be necessary. This Center would include the following:

- * Exhibit area
- * Concession area
- * Restrooms (open from the inside and the outside)
- * Meeting room for 30-40 people
- * Office area

A Maintenance Facility separate from the Forest Information Center is recommended and would include:

- * Office and work area
- * Six garage stall or three stalls that are double deep

A Small Parking Lot (off of Nod Road) which exists on the property should be redesigned and should accommodate the same number of cars as already exists. (20-25)

WILDLIFE

- * Maintain existing diversity in wildlife habitat while still conforming to demonstration tree farm and multiple-use purposes.
- * Maintain adequate supply of snags, den trees and vegetation which produce mast and berries. Some snags also will be created by techniques that deaden larger unmerchantable trees.
- * Create small openings during future harvesting operations. Create and maintain a field for habitat diversity.
- * The river, islands, and the riverbank provide a diversity of wildlife habitat and will be maintained as such in accordance with the Environmental Protection Zone management guidelines and the Wetland Protection Act, Chapter 131, Section 40.
- * Protect rare and endangered plant and animal species and habitat as identified by the Natural Heritage Program.
- * Post the Forest to notify users of hunting seasons.

VEGETATION

- * Protect rare and endangered plant species and their habitat as identified by the Natural Heritage Program.
- * Enforce DEM regulations that prohibit unauthorized cutting and/or removal of vegetation from the forest
- * Allow native wildflowers to be cultivated as approved by authorized individuals for propagation and enjoyment in areas designated as natural in the Natural Resource Management Zone.
- * The natural vegetative communities of aquatic emergent and riparian plants along the Nashua River shoreline and the climax Hemlock, Yellow Birch wetlands area afforded protection under the Environmental Protection Zone.
- * The J. Harry Rich State Forest is primarily a managed, multiple-use forest; therefore, further vegetation recommendations are included in the forestry section of this plan.

GLOSSARY

Active recreation: recreational activities requiring equipment; facilities or a degree of energy.

Aesthetics: branch of philosophy dealing with the nature of the beautiful and with judgements concerning beauty.

Age class: usually determined for the age of a tree at the diameter Breast Height (DBH). In some cases, a constant age to DBH can be added to give total age of the tree.

Aquatic zone: the zone where there is free open water in the middle of a lake or pond.

Archeological: pertaining to the study of the material remains of past human life and activities.

Artificial regeneration: planting or seeding as required to obtain desired regeneration.

Basal area: area in square feet of the cross section of a tree at DBH; Basal area per acre is the area of all the cross sections of the trees at DBH on a given acre.

Board foot: measure used in determining volume lumber. It is referred to as a board, one foot square and one inch thick.

Camping area: areas containing a varied number of campsites.

Canopy: overhead covering of trees.

Commercial thinning: intermediate cut of the main stand designed to enhance the growth and quality of crop trees. The cut material is large enough or of such quality as to be saleable under normal market conditions.

Composition: types of tree species that make up of a stand.

Condition: refers to whether the stand is nonstocked, high risk, sparse, low quality, mature, immature, all aged or in the process of regeneration.

Cord: 128 cubic feet of wood and airspace, and is usually referred to as a stack of roundwood four by eight feet. The average cord of round wood consists of approximately 80 cubic feet of actual wood.

DBH - A silvicultural term Diameter Breast Height is a measurement of the diameter of a tree at approximately 4.5 feet or 1.3 meters above the ground.

Elevation: the altitude of a place above sea level or ground level.

Emergent zone: the vegetative zone where roots of plants are under water and emerging out of the water ie: cattails

Erosion: the process of wearing away by the action of water, wind or glacial ice.

Forest compartments: partitioned off sections of a forest.

Game: those animal species that are hunted for sport.

Geomorphology: the geologic study of the configuration and evolution of land forms.

Glacial: produced by a glacier, a large mass of ice that moves down a slope or spreads over a land surface.

Glacial till: unsorted, nonstratified(non-layered) glacial drift, consisting of particles ranging in size from clay to boulders, transported and deposited by glacial ice.

Groundwater: water found beneath the earth's surface within the zone of saturation.

Habitat: the place or type of site where a plant or animal naturally or normally lives and grows.

Herbicide: a substance or preparation for killing plants, especially weeds.

Historic: in New England, the time period following European settlement, and at least 50 years before the present.

Historic site: an archeological term for a site (ie: any aboriginal mound, fort earthwork, village location, burial ground, evidence of habitation, quarry, cave, standing structure or other location of human land use which is or may be the source of archeological data) dated to the time period following European settlement in New England, and at least 50 years before the present.

Hydrology: a science that deals with the occurrence, circulation distribution and properties of the water of the earth and the earth's atmosphere.

Indigenous: having originated in and being produced, growing, or living naturally in a particular region or environment.

Intensive recreation: high density recreational activities involving a high number of participants on a given site. It includes: pool and nonpool swimming, tennis, picnicking, ice skating, canoeing/sailing, motorboating, golf, site camping, downhill skiing, shooting/archery, trailer camping.

Interpreter: one who provides public programs dealing with cultural, historic and natural resources and park systems.

Interpretive program: educational or recreational programs presented by DEM staff and/or volunteers which focus on the natural and cultural history of the area, as well as DEM management objectives, and public education in the proper use of DEM properties.

Landform: distinctive physical attribute of the land surface produced by geological, biological and hydrological processes. ie: flood plains eskers and valley slopes.

Location: refers to the general placement of a stand and is used to predict the probable difficulty of harvest, use, or treatment.

Management objective: this specifies why a silvicultural recommendation is made: It is assumed that the goals of management are known before the stands in the forest are classified.

Multiple-use: a land management alternative which allows the harvesting of timber with wildlife constraints (protecting den trees, maintaining critical wildlife habitats and limiting the size of regeneration areas). Harvesting operations would be used to create access for hikers, hunters and other dispersed recreationists. Intermediate cuttings such as thinning would be carried out. Harvest cuttings could promote the regeneration of tree species adapted to the site having commercial value. Age classes would be reasonably balanced within compartments to create good interspersions of wildlife habitats and balanced within processing units to assure industry a steady supply of raw material. The harvest or regeneration methods used would be predominately the shelterwood method in evenaged stands and the group selection method in unevenaged stands. Multiple use should take into consideration integrating the uses of the forest: water development, aesthetics, outdoor recreation, and soil protection.

Nongame: those animal species that are not hunted for sport.

Non-point sources: sources of pollution that are generated from one particular area. ie. surface runoff.

Overstory type: the dominant vegetative cover type.

Percolation: the act of liquid passing through a permeable surface (such as water passing through soil).

Point sources: concretely identifiable sources of pollution.

Precipitation: Falling products of condensation in the atmosphere.

Recreation: the refreshment of strength and spirits following work; a means of refreshment or diversion.

Recreational vehicle: a motor vehicle designed to travel over unimproved terrain and which has been determined by the Registry of Motor Vehicles as unsuitable for operation on the public way and not eligible for registration under Chapter 90.

Reforestation: in the process of putting forest trees on a site that is presently non-forested or had its forests previously removed.

Regeneration: seedlings, seedling sprouts, or sapling sprouts of tree species which may come from advance growth, seeding from trees cut shortly after a heavy fall of seed, sprouts from coppice (cut trees that sprout), seeding from surrounding uncut mature stands or from residual trees, or from planting or direct seeding.

Regeneration cut: a cutting that done to stimulate or produce regeneration.

Regional Context: general characteristics of a particular region.

Right-of-ways: a legal right of passage over another persons land.

Riparian zone: vegetative zone along the bank or shore of a body of water.

Seedling: a tree of less than one inch DBH in size.

Shelterwood: The Shelterwood system retains enough trees to provide optimum amount of seed required to restock, but not to overstock the area.

Site index: the total height of the tree at 50 years of age.

Size: refers to the average diameter of the stand.

Species: The major subdivision of a genus or sub-genus regarded as the basic category of biological classification, composed or related individuals that resemble one another and are able to breed among themselves but not to breed with members of other species.

Stand: an aggregation of trees or other growth occupying a specific area and sufficiently uniform in composition (species), age arrangement, and condition as to be distinguishable from other growth on adjoining areas.

Topography: the relief features or surface configuration of an area.

Toxicity: the quality, relative degree, or specific degree of being toxic or poisonous

Understory type: the vegetative cover type that lies beneath the overstory.

Vista: a distant view through or along an avenue or opening.

APPENDIX 1: Public Meeting Minutes

Synopsis of Public Meeting February 24, 1987 7:30-9:30 Co-sponsored by the Massachusetts Department of Management (DEM) and the J. Harry Rich State Forest Advisory Committee.

PRESENT: George Keyes, Lorna Levi, Harlan Fitch, Axel Larsen, Walter Hoyt, Liz Fletcher. Jack Lash and Don Stoddard were present from the Department of Environmental Management.

Minutes of the previous meeting were accepted as read. Don gave a further description of the DEM acquisition process. The primary decision-making group for acquisition is the Capital Projects Committee, headed by the Director of Forests & Parks, the Deputy Commissioner for Planning, and the Director of Engineering. This Committee reviews reports on potential acquisitions prepared by the DEM regional offices, then decides whether or not to proceed with appraisals.

RAILROAD: The revised appraisal is now under study by DEM counsel, who would like to look at the property first before accepting the appraisal. Only one appraisal has been revised; the other appraisal that had been previously completed was not acceptable for revision.

On March 4, the Pepperell Selectmen's meeting will be discussing the relocation of Main Street in East Pepperell, using the abandoned railroad. This is a longstanding plan which has been previously discussed. Don thought it would be workable as long as the continuity of the trail will be maintained.

LAND BETWEEN RIVERS AND OTHER POSSIBLE ACQUISITION: George showed a map of the parcels B&M is offering as a package: the 7-acre piece on the Land between the Rivers, a paper mill spur, and lengths of track connecting these with the abandoned line now owned by Fisheries & Wildlife. The report on the Land between the Rivers, completed by DEM Planner Jennifer Melville before she left for Australia, was distributed to members. Everyone was glad to see that she noted the importance of this area to the whole Nashua River Greenway-Railroad Trail network, and that she recommended acquisition.

Harlan reported that the Groton Planning Board will be holding a hearing on March 5 to discuss the conceptual plan for the Shepley Hill land. 11 houses are proposed, to be located chiefly in the southern portion. Conservation land is proposed along the railroad.

MANAGEMENT PLAN: Jack distributed draft copies of all that has been compiled to date. These were put together by Theda Leonard. Jack thought that together he and she could finish filling the remaining gaps in the plan quickly. Beginning March 1st, 2 word-processing people can be working on the plan. Jon Geer arranged for their services.

APPENDIX 1: (con'd)

Once the gaps in the draft are filled, a meeting will be set up with selectmen, police, and fire departments of the 4 towns (Ayer, Dunstable, Groton & Pepperell). An executive summary of the plan (12 pages or less) will be prepared for town officials. George suggested that now the management plan is progressing, the Committee would like input from Ayer. Don will check with Bill Redfield, Ayer Public Works Superintendent, to see who from Ayer would become involved.

Don reported that staff from Willard Brook has checked the Forest by snowmobile and found the gate by the RR closed. They noticed quite a bit of use: snowmobiles, cross-country skiers.

The meeting adjourned at 8:55 p.m.

NEXT MEETING: Tuesday, April 7th at 7:30 p.m. at Groton Legion Hall.

APPENDIX 2: Indigenous Wildlife at J. Harry Rich State Forest

The following list was compiled using all possible means. Where an animal is known is to be present, it is designated by an asterisk in the left hand margin. Some mammals are listed as "potential" where habitat seems to be suitable. No trapping was done and the small mammals on the list are not adequately represented.

Opossum, Didelphus virginianus Potential, even probable during the periods of expansion of the population.

Starnose mole, Condylura cristata Potential

Short-tail shrew, Blarina brevicauda Potential

Naked shrew, Sorex cinereus Potential

* White-footed mouse, Peromyscus leucopus Hickory nuts were found opened in a way that indicated the probable presence of this or the following species.

Deer mouse, Peromyscus maniculatus Potential

Red-backed vole, Clethrionomys gapperi Potential

Pine vole, Microtus pinetorum Potential

* Muskrat, Ondatra zibethica Present in the river as evidence by scats deposited at the edge of the water. Adequate food and shelter available.

* Porcupine, Erithizon dorsatum Scats and feeding signs. A small population.

* Woodchuck, Marmota monax One active woodchuck burrow, a few older burrows as well.

* Chipmunk, Tamias striatus The champion "sight record" holder, chipmunks seemed to be running, scolding, and popping in and out everywhere.

* Red squirrel, Tamiasciurus hudsonicus Sight and sound records, but much rarer than the gray squirrel.

* Grey squirrel, Sciurus carolinensis Many sight records, and constantly vocal.

Flying squirrel, Sciurus carolinensis Many sight records, and constantly vocal.

APPENDIX 2: (con'd)

Flying squirrel, Glaucomys sp. Probable, since adequate food supplies exist. There may be fewer suitable den trees than in a woodland where forestry practices have reduced the number of dead and decaying trees.

Snowshoe hare, Lepus americanus Potential

Eastern cottontail, Sylvilagus floridanus Potential

* New England cottontail, Sylvilagus transicionalis One rabbit was seen and has been identified as S. Transitionalis because it was located in a wet brushy area which is the appropriate habitat for this specie.

Bear, Ursus americanus Unlikely. However, signs of bear were found on the Mt. Wachusett State Reservation in 1977.

* Raccoon, Procyon lotor Scats, tracks, signs of feeding.

Weasel, Mustela frenata Potential

* Mink, Mustela vison Prints were found in two places.

* Fisher, Martes pennanti Potential. The population is increasing, the animals are willing to enter suburban areas, and the food supply is adequate.

* Skunk, Mephitis mephitis One is living in a woodchuck hole near the Railroad ROW.

* Otter, Lutra canadensis Excellent prints were found in July, and snow tunnels were seen in February.

* Red fox, Canis vulpes Scats of fox were found, and a sighting was reported in early autumn.

Gray fox, Canis cinereoargenteus Potential.

Coyote, Canis latrans Potential.

* Bobcat, Felis rufus A bobcat was sighted in a thicket near a stream on the eastern border of the Rich Tree Farm, and good tracks were found near the river several days later.

Deer, Odocoileus virginianus The only sign of deer was browsed Viburnus probably eating during late winter or early spring. Deer are probably more common in the more open agricultural land nearby.

The following are all sight records.

* American toad, Bufo americanus

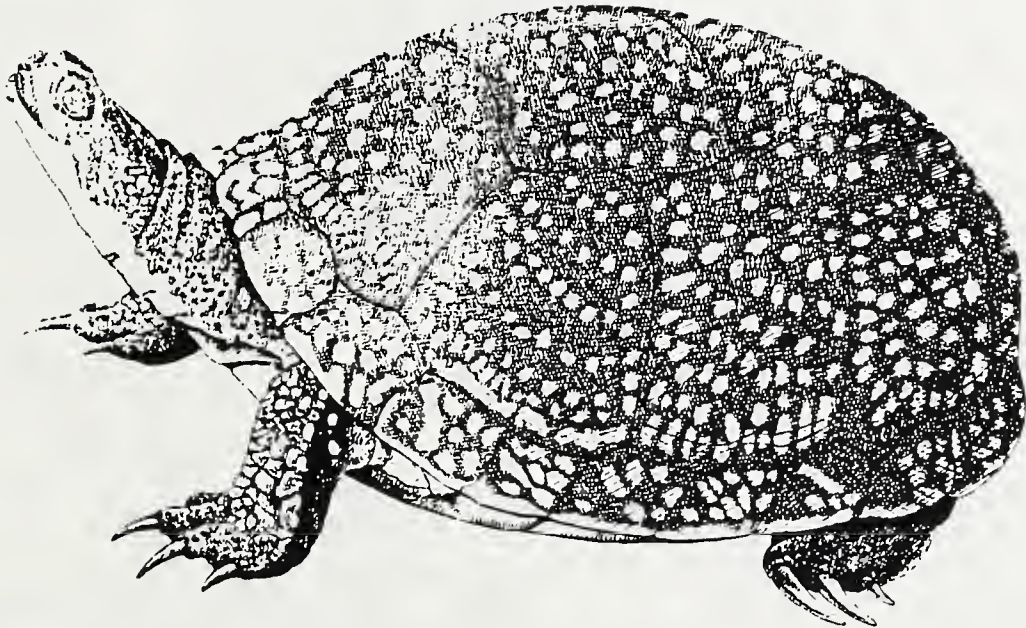
* Pickerel frog, Rana palustris

* Green frog, Rana clamitans

APPENDIX 2: (con'd)

- * Bullfrog, Rana catesbiana
- * Blanding's turtle, Emydoidea blandingii
- * Snapping turtle, Chelydra serpentine
- * Spotting turtle, Clemmys guttata
- * Painted turtle, Chrysemys picta
- * Water snake, Natrix sipedon
- * Garter snake, Natrix sirtalis
- * Ringneck snake, Diadophus punctatus
- * Black racer, Coluber constrictor DOR

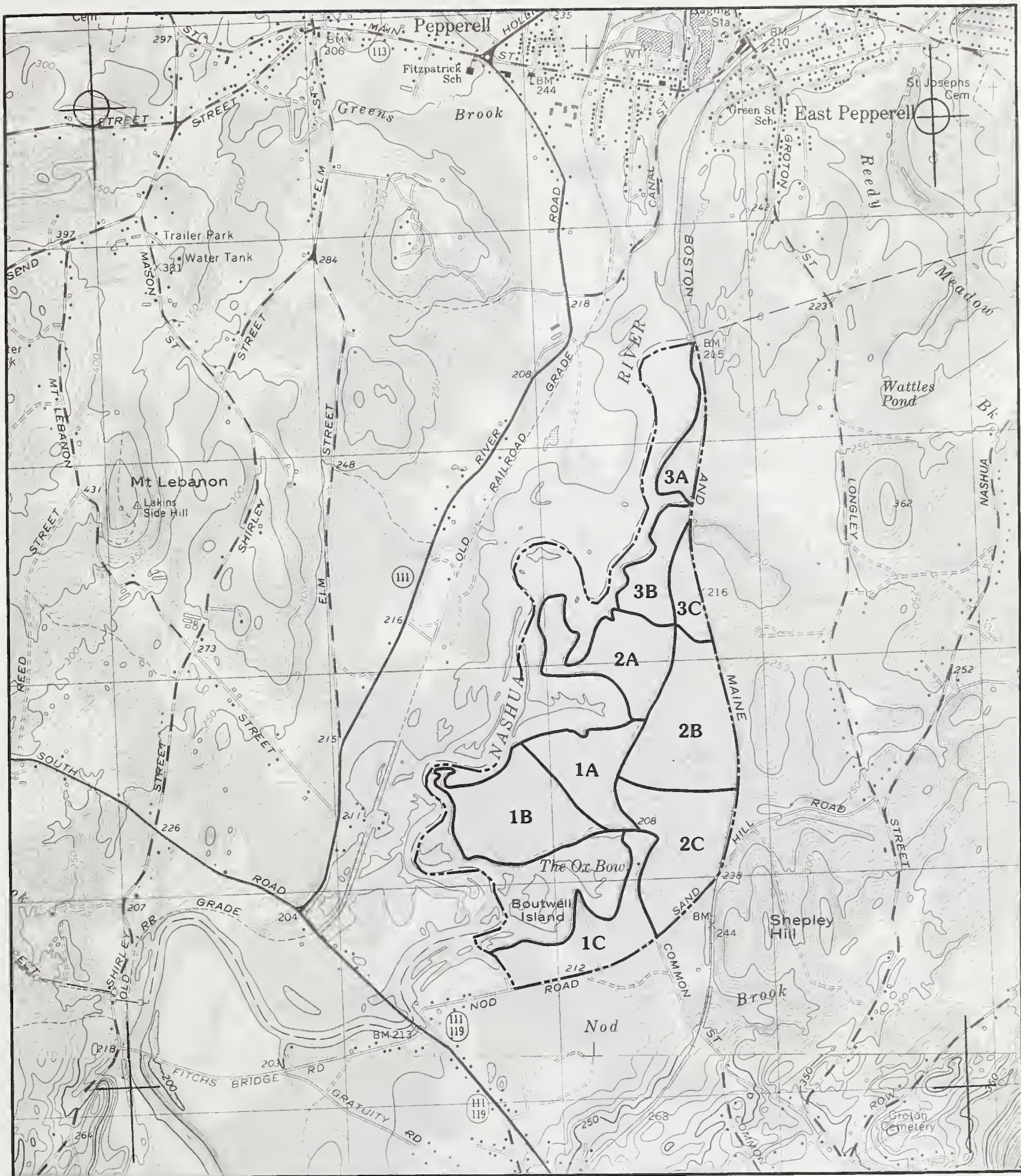
- * legal, non-destructive



Blandings's Turtle

Source: New England Wildlife: Habitat, Natural History and Distribution

According to the Massachusetts Natural Heritage Program, the Blanding's Turtle is an Endangered Species.



**J. Harry Rich
State Forest**

PREPARED BY
THE MASSACHUSETTS DEPARTMENT
OF ENVIRONMENTAL MANAGEMENT

Demonstration Forest Compartments

Guidelines for
Operations
And
Land
Stewardship



APPENDIX 4

DEED

KNOW ALL MEN BY THESE PRESENTS

That Rich Tree Farms & Forestry Corp., a corporation under the laws of the Commonwealth of Massachusetts, whose principal place of business is at Montague Road, Leverett, Franklin County, Massachusetts for consideration paid of Four Hundred Thirty-Four Thousand Dollars (\$434,000.) grants to the Commonwealth of Massachusetts, Department of Environmental Management, 100 Cambridge Street, Boston, Massachusetts, under the authority of and, in accordance with the provisions of Chapter 132A, Section 3 of the General Laws, as amended, with QUITCLAIM Covenants, the land in Groton, Middlesex County, Massachusetts, containing 506 acres more or less and more precisely bounded and described as follows:

Parcel I

A parcel in GROTON bounded northerly by the boundary line between said Groton and the Town of Pepperell in County of Middlesex, and by the Nashua River; westerly by the Nashua River; southerly by the Nashua River, by land now or late of the Estate of George E. Boutwell and by land now or late of the estate of Warren Clark; westerly again by the last mentioned land, easterly by the same land, southerly again in part by the same land and in part by the northerly end of a private way known as Hazard Road (all or part of so much of the last mentioned four boundary lines as are not formed by said River, and said Road being along a moat or ditch running between said River and the northerly end of said Road; westerly again by said Road 31 rods, southerly again by land now or late of Harry E. Nutting 47 rods; westerly again by the same land 99 rods; southerly again by the same land 92 rods and easterly by the location of the Boston & Maine Railroad 397 and 6/10 rods. Containing 406 and 39/100 acres, more or less".

Being the same premises conveyed by Joseph Harry Rich to grantor, recorded at Middlesex County Registry of Deeds, Southern District at Book 10502, Page 496, referred to therein as parcel 1.

Parcel II

Also the land in said GROTON known as the "Nod Pasture" containing 40 acres more or less and bounded and described as follows: Beginning at the southwesterly corner of said parcel at a stake and stones at the northerly side of the road leading from Hollingsworth's Mills to Dunstable and called the "Nod Road"; thence running northerly by land formerly of John G. Park to the Nashua River; thence running down and by said river to and across the brook running from the moat to said river and about 35 rods below said brook by said river to an oak stump by said river at land now or formerly of Asa A. Lawrence; thence running easterly by land now or formerly of said Lawrence 12 rods and 30 links to a stake and stones; thence running easterly by land now or formerly of said Lawrence 11 rods to a stake and stones near the moat; thence running in the same direction to the middle of said moat; thence running south-

easterly and southerly by the middle of said moat and by land now or formerly of Josiah Clark to said road; thence running westerly by said road to the point of beginning. Excepting that part of said premises described as follows, to wit: "Part of a certain lot of land situated in GROTON in the Commonwealth of Massachusetts, known as the "Nod Pasture", and bounded and described as follows, viz:

Beginning at the southeasterly corner thereof at a stone on the northerly side of the road leading from Hollingsworth Mills to Dunstable, and called the "Nod Road"; thence running N. $2^{\circ} 20'$ E. 523 feet by land now or formerly of Josiah Clark; thence N. $88^{\circ} 34'$ W. 416.5 feet; thence S. $2^{\circ} 20'$ W. 523 feet to the so-called "Nod Road"; thence by said road 416.5 feet to the place of beginning. Containing five acres, more or less.

Being the same premises conveyed by Joseph Harry Rich to grantor, recorded at said Registry at Book 10502, Page 496, referred to therein as parcel 2.

Parcel III

Also the land in Groton, on Nod Road and known as Nod Pasture, bounded and described as follows: Beginning at the southeasterly corner of the premises at a stone bound at the northerly side of the road leading from Hollingsworth Mills to Dunstable and called Nod Road, thence running N. $2^{\circ} 20'$ E. 523 feet by land formerly of Josiah Clark; thence N. $88^{\circ} 34'$ W. 416.5 feet; thence S. $2^{\circ} 20'$ W. to Nod Road, a distance of 523 feet; thence easterly by said Nod Road 416.5 feet to the place of beginning. Containing five (5) acres, more or less.

Being the same premises conveyed by J. Harry Rich to grantor, recorded at said Registry at Book 10502, Page 494.

Parcel IV

Also the land in Groton, on Nod Road, bounded and described as follows: Beginning at a stone bound on the northerly side of said Nod Road thence running easterly along said road 1400 feet, more or less, to the intersection of Nod Road and Common Street; thence running northerly by land of J. Harry Rich and Madge Rich 300 feet, more or less, thence continuing northerly by land of grantee 617 feet, more or less, to a stone bound; thence north $76^{\circ} 45'$ W. to the center of a moat; thence following the center of the moat by land of grantee to a stone bound; thence South $46^{\circ} 29'$ W. about 95 feet to the center of a moat along property of grantee; thence in a general southerly direction by property of grantee about 900 feet by center of moat; thence south $2^{\circ} 20'$ W. by land of grantee and land of Phyllis Davieau 685 feet to the point of beginning. Containing 25 acres, more or less, formerly owned by Warren Clark.

Being the same premises conveyed by J. Harry Rich to grantor, recorded at said Registry at Book 10502, Page 492.

Parcel V

Also the land in Groton at the corner of Nod Road and Sand Hill Road, bounded and described as follows: Beginning at a stake and stones at the southwesterly corner of the premises on Nod Road and the road leading to the place of Joseph D. Nutting, thence northerly by said last mentioned road to a stake and stones at land late of John Frawley; thence easterly and northerly by said Frawley and Nutting land to a stake and stones at land late of Charles Prescott; thence easterly by said Prescott land to Worcester, Nashua and Portland R. R.; thence westerly by said railroad to said road; thence southerly by said road to the point of beginning. Containing thirty-five acres, more or less.

Being the same premises conveyed by J. Harry Rich to grantor, recorded at said Registry at Book 10502, Page 498.

Said premises are conveyed subject to an easement and permanent right of the Nashua River Paper Company to flow parcels 1, 2 and 3 above as set forth in a deed from Arthur D. Hill et al, Guardian of Lawrence Brooks, dated October 10, 1923 and recorded at said Registry at Book 4663, Page 231.

Also subject to the rights of Mary Iola Clark Brown and Irene Clark Flower to enter the premises for camping and gathering flowers and greens during their lives as set forth in a deed recorded at said Registry at Book 8000, Page 168.

Also subject to any real estate tax liability which may arise by virtue any of the above-described land of the withdrawal of ~~parcels 1, 2 and 3 above~~ from classification as forest land under chapter 61 of the Massachusetts General Laws.

The property hereby conveyed shall be perpetually known and designated as the "J. Harry Rich State Forest."

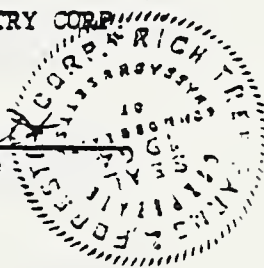
Meaning to Convey all right, title and interest to the lands described herein.

Real Estate Taxes shall be prorated until the day of recording.

Witness my hand and seal this day of ^{16th} January, 1981

RICH TREE FARMS & FORESTRY CORP.

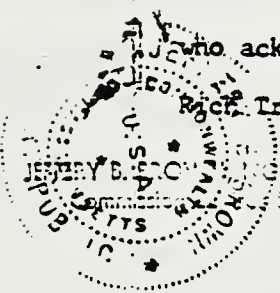
by: Herschel G. Abbott
Herschel G. Abbott, Vice
President and Treasurer



COMMONWEALTH OF MASSACHUSETTS

HAMPSHIRE County, ss. January 16, 1981

Then before me personally appeared the above named Herschel G. Abbott who acknowledged the foregoing instrument to be the free act and deed of the Rich Tree Farms & Forestry Corp.



Jeffery B. Brown
Notary Public JEFFERY B. BROWN
Sept. 17, 1987

My Commission Expires:

Approved as to form:
Daniel R. Gaffney
Assistant Attorney General

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ACKNOWLEDGEMENTS

This report was prepared as a cooperative effort between the Division of Forests and Parks and the Division of Planning and Development, within the Department of Environmental Management.

James Gutensohn, Commissioner

Division of Forests and Parks

Gilbert Bliss, Director

Don Stoddard, Regional Supervisor, Region 2

Division of Planning and Development

Robert Kumor, Deputy Commissioner

Jack Lash, Director, GOALS Program

Primary GOALS Planning Team

Jonathan Geer, GOALS Planner

Theda Leonard, Scenic Rivers Program Director

Lori Keough, GOALS Planner

Don Stoddard, Regional Supervisor

Dave Hall, Ass't Regional Supervisor

Darrell Keay, Management Forester

Harry Penniman, Ass't Management Forester

Wesley Adams, Senior Supervisor, Willard Brook State Forest

Secondary GOALS Planning Team

Gail Temple, Coordinator, Cultural Resource Program

Andrea Lukens, Supervisor, Interpretive Program

Ellen Rothman, Chief of Interpretive Services

Paul Perodeau, District Supervisor, IPC

Steve Frieswick, District Fire Warden

Walter Hoyt, District Manager, Massachusetts Division of Fish, Wildlife and Environmental Law Enforcement

J. Harry Rich State Advisory Committee Members

AYER Mr. William G. Redfield

DUNSTABLE Mrs. Judy A. Larter
Mrs. Andrew Pike

GROTON

Mr. Harlan Fitch
Mr. Richard K. Irons
Mr. Robert N. Pine
Mr. Harrison S. Ripley
Mrs. Marion F. Stoddard

PEPPERELL, EAST PEPPERELL

Mr. Robert Halphin, Administrative
for Town of Pepperell
Mr. George Keyes (East Pepperell)
Mr. Axel Larson, Jr.
Mrs. Herbert W. Levi

Associate Committee Members

Mr. James Mulford, Ayer

Prof. Hershel Abbott,
Leverett, MA

Mrs. Nancy Nielsen
Lubec, Maine

Mr. Walter Hoyt
Acton, MA

Mr. Edward Himlan
Fitchburg, MA

Mrs. Elizabeth Fletcher

Local Legislators

Senator Paul J. Sheehy

Rep. Augusta Hornblower

